PENCIL POINTS

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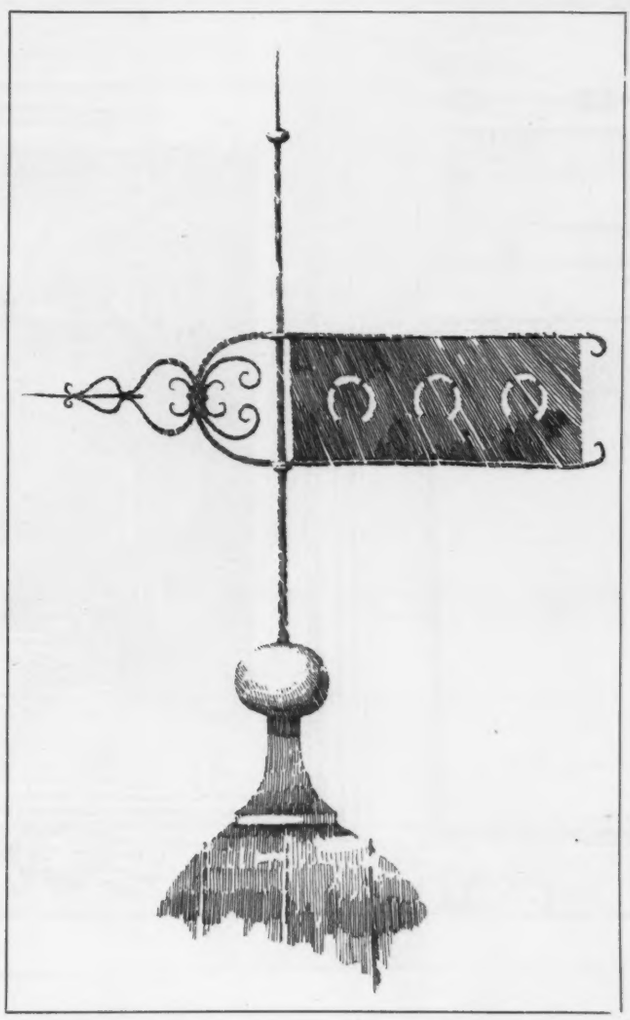
THE PEN-AND-INK DRAWINGS OF JAMES IRZA ARNOLD

By Rayne Adams

SUCH IS the versatility of man that the marking off of limitations in the arts as in the sciences is fraught with danger. So often the analyst is discredited by the arrival of some genius who easily knocks down the ninepins that have been so confidently set up. In considering pen-and-ink drawing as it relates particularly to architectural rendering, it seems safe to say that its field is a wide one. Yet, as one thinks of the pen-and-ink drawings which have made most appeal, this generalization emerges: the genius of pen and ink lives in the sunlight. Sunlight is quite as necessary to his being as was flame and fire to the salamanders of the alchemists. And the providing of flame for the one was no more difficult than is the maintaining of sunlight for the other.

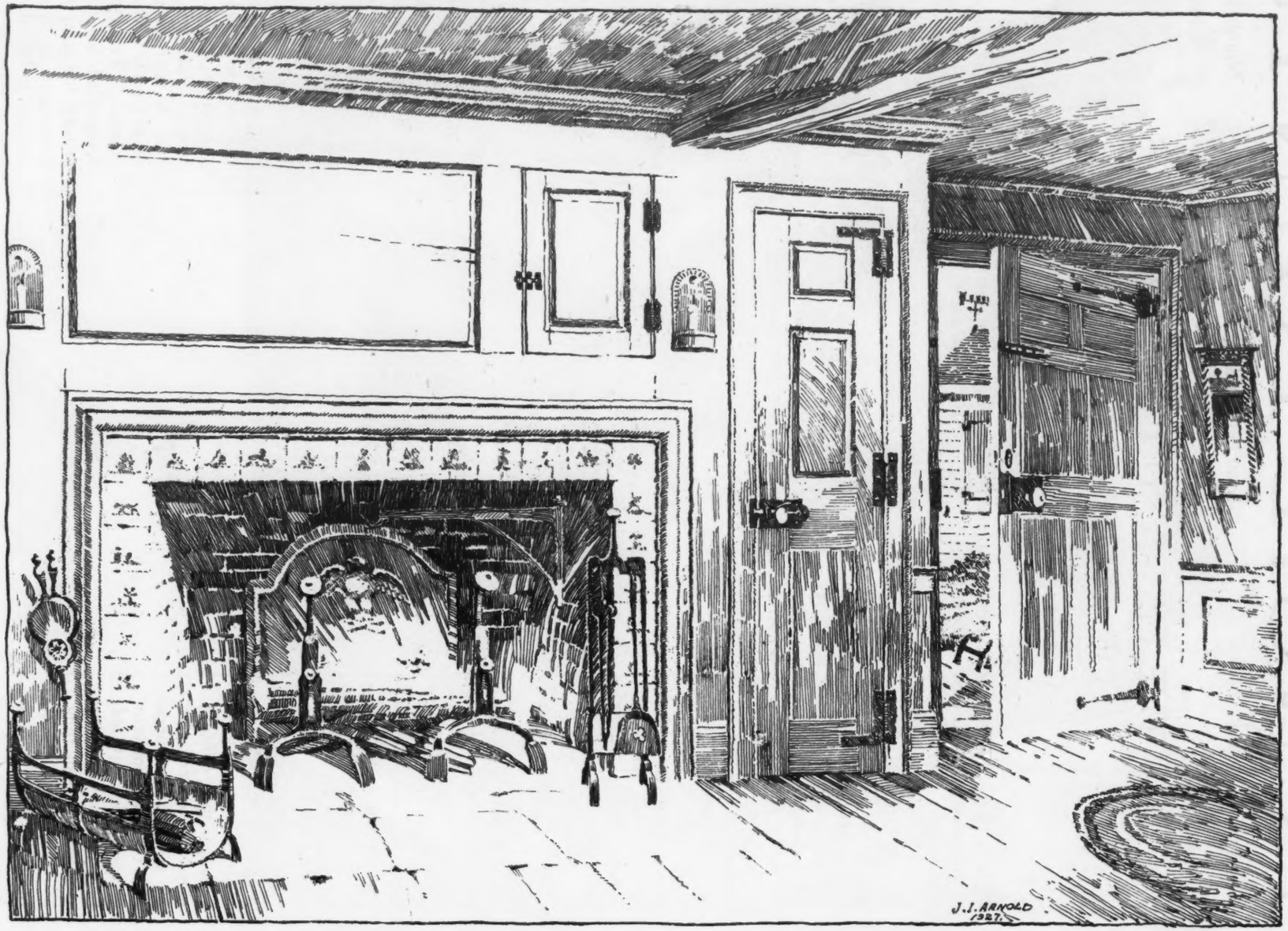
This is only another way, I suppose, of saying that there is, doubtless, no medium more absolute than pen and ink. And the major difficulty comes down pretty much in the end to the solving of the problem of the indication of *tone* or, especially, light or faint values. With pencil or wash, in lithography and etching, this difficulty may be minimized. Yet in pen-and-ink indication, the most competent of men, such as Goodhue, did not really find the secret of indicating, at least in small-scale drawings, light tones or values, irrespective of texture, which correspond to the values given us in the outdoor world. And with lesser men how often is the virility of the black ink and white paper contrasts so lost by the employment of what may best be characterized as injudicious shading.

The upshot of the attempt to solve the problem of light indeterminate values is the yielding to the temptation to follow one of two courses, the first being evasion, the second suggestion. I am not forgetting that it is possible to use pen and ink so that it borders on the technique of etching—in which a multiplicity of fine lines may work wonders. But etching has this to save it: it is always possible to obtain light tones, irrespective of the needle marks, by leaving just enough ink on the copper plate. This fortunate remedy is the birthright of those media which require printing for their fulfillment. The pen-and-ink drawing is direct: its salvation or damnation lies in the pen itself.

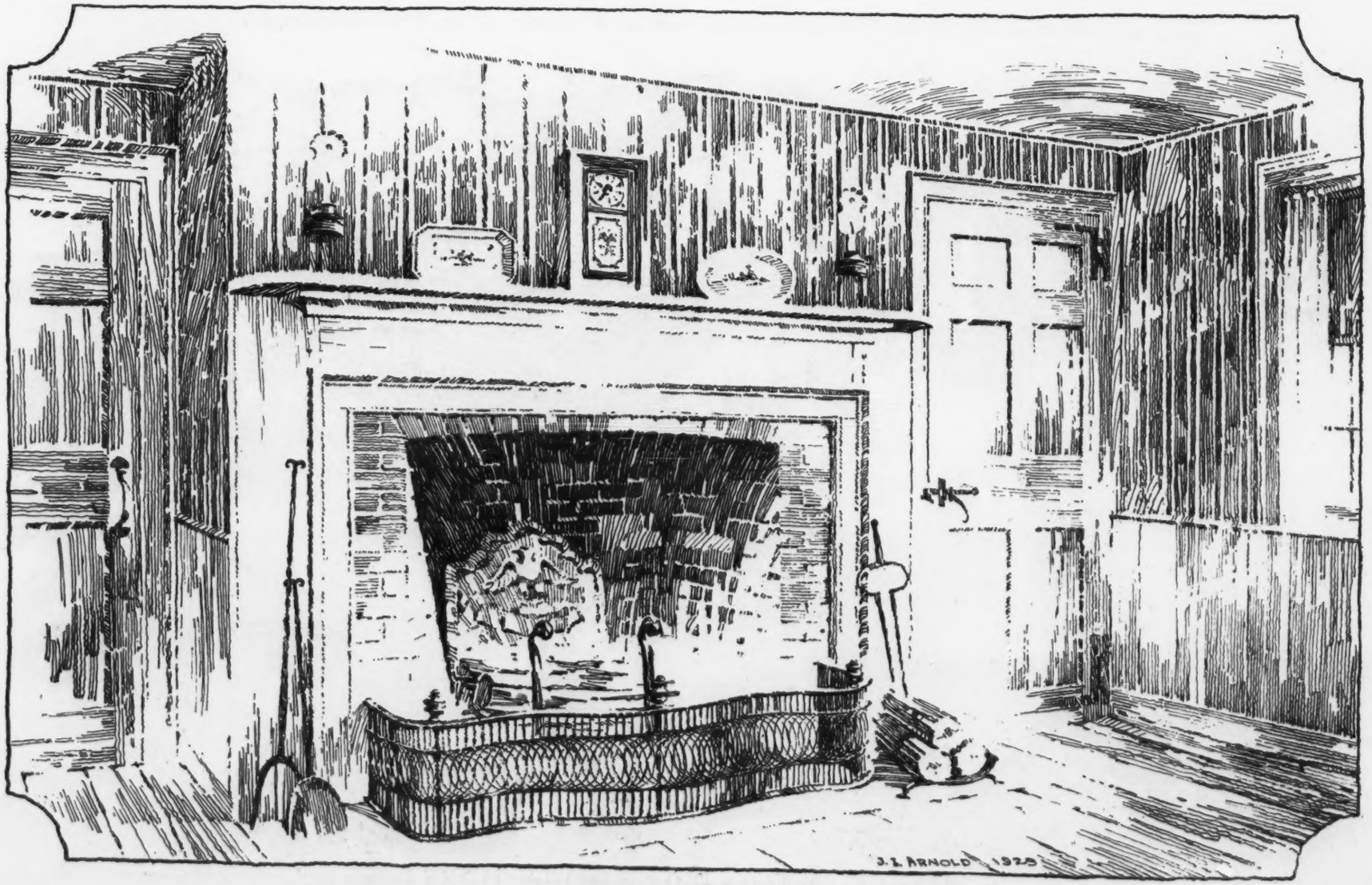


STUDY, BY J. I. ARNOLD, OF A WEATHER VANE

An excellent illustration of the old adage which advises one to bend before the storm lest he break is seen in the ancient and honored custom of evasion. This consists of the premeditated avoidance of certain subjects. Look, for example, through Griggs' drawings and note how rarely he shows trees in the middle distance. Trees in the background are treated broadly and trees in the foreground in detail—but the middle distance tree is generally absent. The second way out of the woods is that of suggestion and it is illustrated in scores of Rail-



STUDY BY J. I. ARNOLD OF AN EIGHTEENTH CENTURY AMERICAN FARMHOUSE INTERIOR SHOWING AUTHENTIC HARDWARE

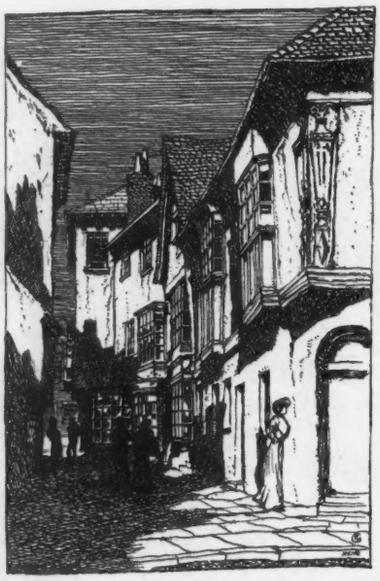


AN EARLY NINETEENTH CENTURY AMERICAN FARMHOUSE INTERIOR AS DRAWN BY J. I. ARNOLD

A PEN-AND-INK STUDY BY J. I. ARNOLD OF AN ENGLISH WAYSIDE TAVERN IN THE COTSWOLD MANNER

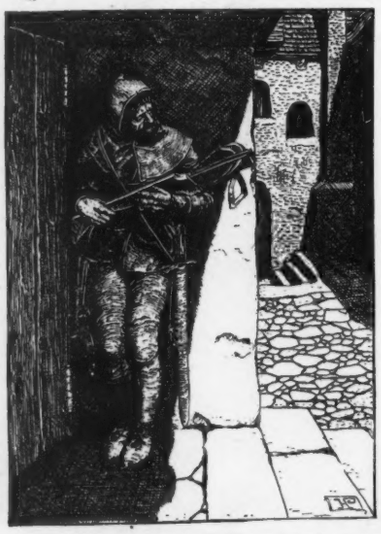
ONE OF THE MANY FINE OLD LONG ISLAND FARMHOUSES WHICH, UNFORTUNATELY, ARE RAPIDLY DISAPPEARING

ton's drawings. A red brick wall has, it will be admitted, a most distinctive color, and, commonly, texture. Yet if, in a pen-and-ink drawing, one attempts to give a naturalistic value to this wall, the sunlight is very likely to escape and desert him altogether. To the sophisticated the way out of this unhappy situation is justified. By rendering a relatively small portion of the wall—indicating the bricks in this small section, usually forcing the scale, and leaving the rest of the wall *white*—it is possible to *suggest* the rough texture and the color value. In some of Pennell's drawings one may see a brick indication given by short broken irregular lines, and though it be perhaps more truthful it is, paradoxically, less satisfactory in the impression it gives us. If one could imagine a psychoanalyst devoting an instant's time to so austere a subject as pen-and-ink drawing, he would probably say that the acceptance of these subterfuges simply goes to prove that human nature is most accommodating: we see an indication of texture and material on a portion of the picture of the wall and we graciously assume that the rest of the wall is made of the same material. If we weren't so accommodating, pen-and-ink would vanish from the world of architectural rendering.



DRAWING BY F. L. GRIGGS
From "Highways and Byways in Hertfordshire"

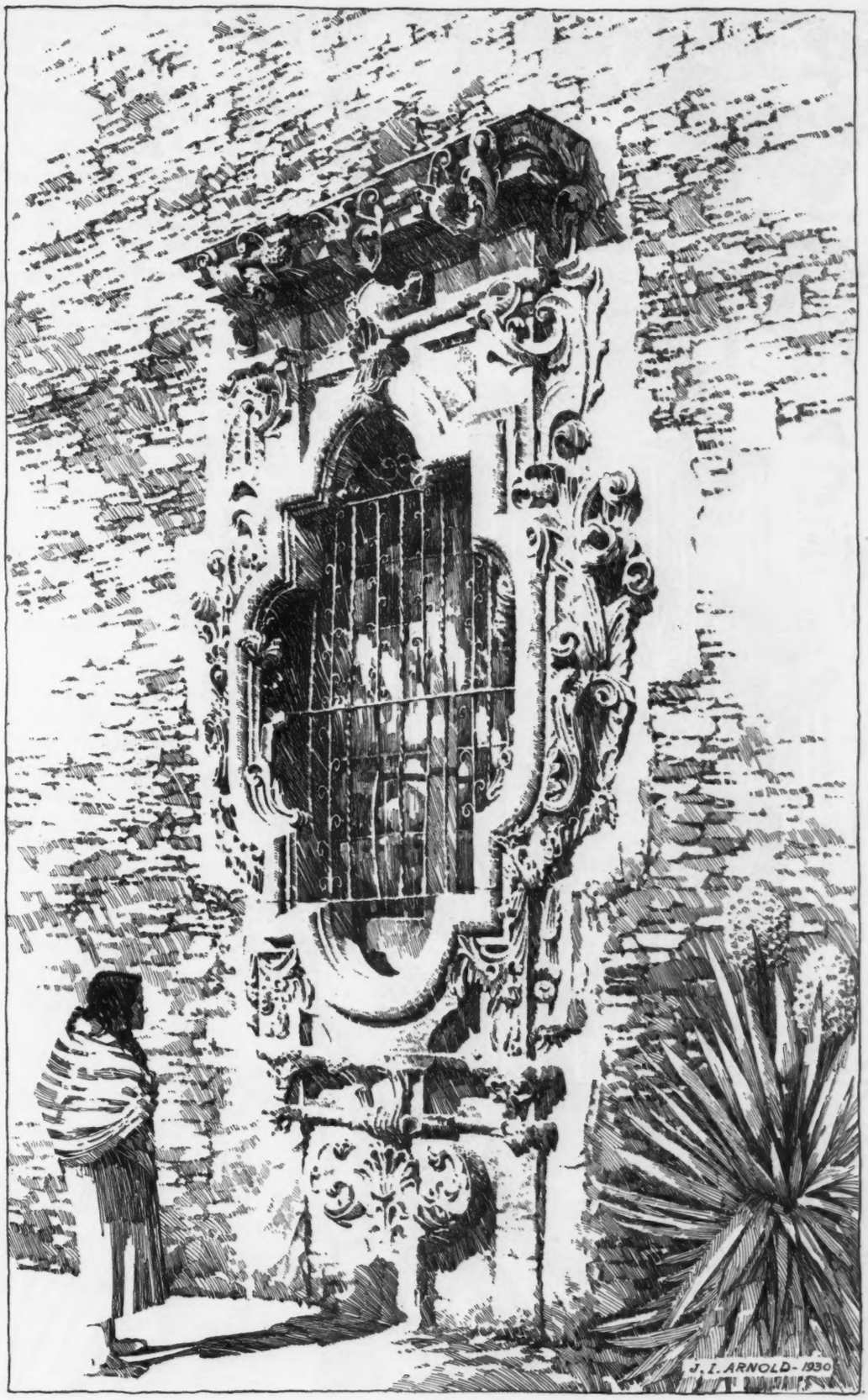
Of course I am referring to the use of pen and ink used for portraying not outline, but surfaces of light and shade, color and texture. The amazing thing about the drawings of a young and untrained child is that he represents objects practically always in outline. Yet outline is a very great abstraction and one might suppose that it would not be the bond of union between Vierge or Lepère and the untutored child. Properly speaking, as philosophers of the oldest vintage have told us, outline does not exist in nature, except as we conceive of that impalpable division between light and shade, or between this color and that. And who can say where the exact edge of a shadow is? Examined closely, it is always a blur. The explanation doubtless lies in the fact that the child's imagination is free and that the imagination of Lepère, by the grace of Fate, was unspoiled. Even with what imagination we may have, we shall, if we are attentive, be able to metamorphose the marvellously simple line drawings of Lepère into pictures which are full of color, light and shade, though the indications to guide us be of the slightest.



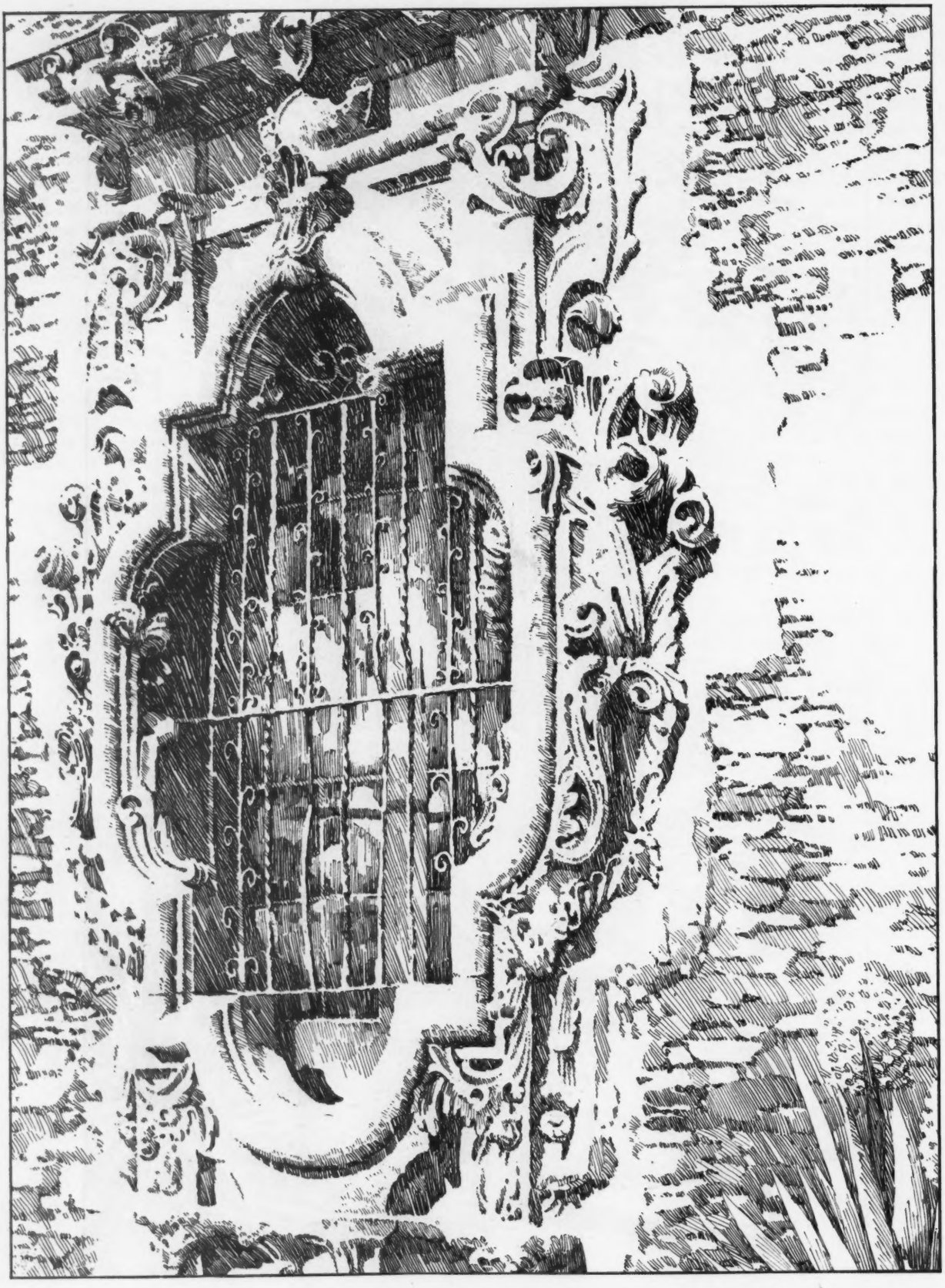
DRAWING BY HOWARD PYLE
From "Otto of the Silver Hand"

Perhaps it is the extreme convention to which pen-and-ink drawing is subject which is the secret of its appeal. Since it is capable of representing certain things so well, one is tempted to make it serve where it will not. And since its limitations are so patent, shall one not excuse the masters' use of *legerdemain* if it brings success. Railton's drawings are full of "tricks": the skillful falsification of values so that a *pattern* may be achieved. That pattern—a half rendered brick post falling into ruin—attracts the eye and we read into it some strong impression of reality. It is not *like* the brick post as we saw it—but it *suggests* some aspect of it. And since our impressions of reality are, according, again, to the most accomplished philosophers, discontinuous and fragmentary, this slight suggestion serves its end and makes the post a vital part of our experience.

If one may justifiably play fast and loose with values, are any rules for pen and ink possible? As in every other field there are rules:—the rules that we establish for ourselves. The difficulty is always getting another to see the validity of our rules. I recall that, a quarter of a century ago, the late David A. Gregg conducted a course in pen-and-ink drawing at the Massachusetts Institute of Technology (what a dreadful long name with which to clutter the world). Gregg was, at that time, perhaps the most capable of architectural renderers in pen and ink. It is doubly fitting here to recall the charm of his modest qualities—doubly, because it is always fitting to speak well of the dead and because Gregg's students owe him so much. He possessed an outstanding technique himself but he did not attempt to impose it on others. He had, however, his prejudices. He objected to cross hatching with lines at right angles. Yet one may see in Howard Pyle's drawing from "Otto of the Silver Hand" that such cross hatching may be used with distinction. One may go further. In the drawing by Griggs the cross hatching is built up of lines which are subject to no discernible system. And it seems to me that this latter freedom from observance of system in indication brings us into a happier frame of mind than does the systematic indication to which Gregg was habitually given.



A SPANISH-AMERICAN BAROQUE WINDOW IN TEXAS



DETAIL, AT ORIGINAL SIZE, OF DRAWING BY J. I. ARNOLD SHOWN ON PRECEDING PAGE

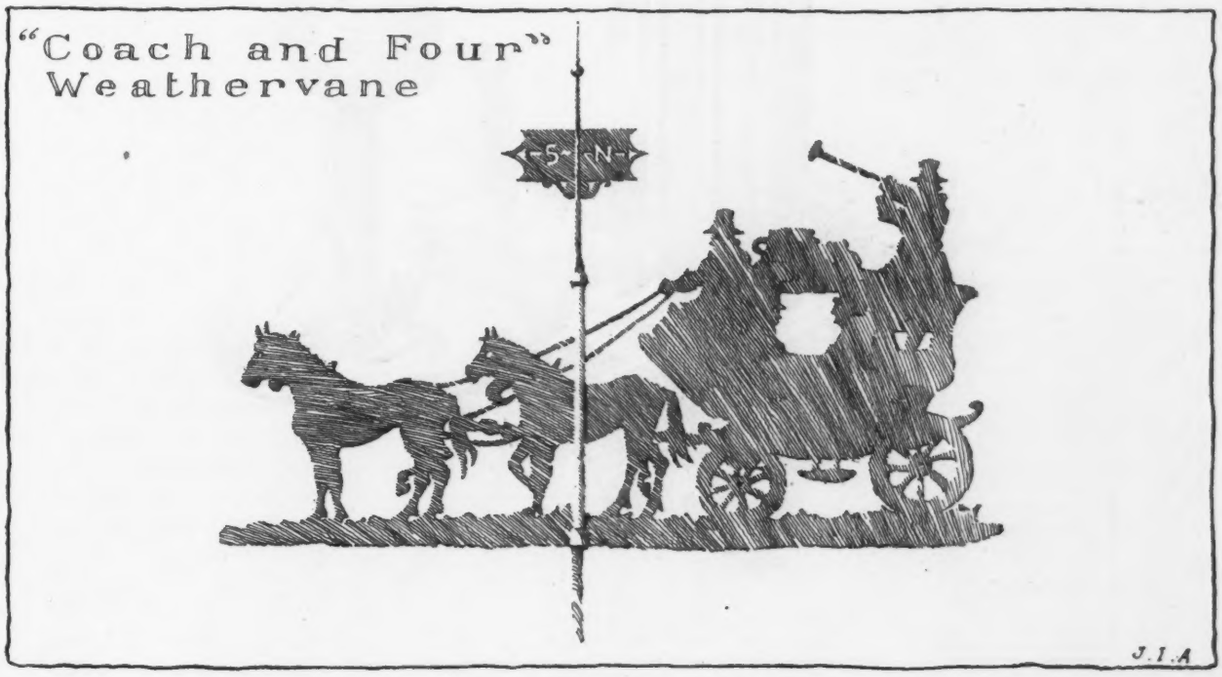
There is—if one may presume to Emersonize—a lesson in this. Teachers should, for the most part, be silent, and the students should do all the talking. Such a system of education would undoubtedly produce a lot of bosh—but it would not be systematized bosh. The student would attack his subject with the indirection of a child whose eyes do not focus and who lunges incontinently, yet with certainty of purpose and uncertainty of aim, at some nearby object. Later the child will learn to use his knife like everybody else—and originality will be supplanted by convention. As a part of the social state we live by mutual submission to such limitations as proscribe eating with one's knife. However valid such conventions may be in the world of intercourse, there is no reason why they should apply to the world of art. The student should be given a pen and in response to his question, "What do I do with this?" he should be told, "Find out." God knows that he may make better drawings with the butt end of the pen than with the point.

I suspect, from what Mr. Arnold has told me, that his beginnings in pen-and-ink work were highly experimental. His first drawing was made at the age of twelve with ordinary blue ink, and it would be interesting to reproduce it here. That, however, is not possible. Having made this drawing, he experimented with it. He attempted to pass a wash over certain portions in order to obtain those light tones which are so elusive, with the result that the ink spread with the rapidity and effectiveness of the seven plagues which overran Egypt. From that time on Mr. Arnold has sought very seriously *how* to do pen and ink. He has attempted to interpret, in terms of his own technique, by close observation of things as they are in nature, how they may be indicated. I think he has succeeded admirably, and especially in one difficult field. His drawings of such lowly and beautiful objects as Colonial hardware and utensils impress me with the fact that he has labored conscientiously to find how to express these objects. Look, for example, at his drawing of a weather vane, shown below. It is supposed to represent metal: and one easily believes it. Such indication looks easy. Try it.

Of course, the renderer in pen and ink—or other media—in dealing with our modern civic architecture at least, meets obstacles. Men like Railton and Griggs, Chamberlain and Rosenberg, stick pretty closely to the tumble-down ruins of an ancient architecture in which walls and roofs seem always to dominate. They avoid, one may assume, just-built architecture. I hazard the doubt if one could persuade Griggs to make a drawing of one of our stepped-back skyscrapers. I hasten to forestall correction by saying that if he has made such drawings I have not seen them.

At least our modern work of this kind has not attracted Mr. Arnold. He has found a special interest in early Colonial work. Born in New York State, he attended Syracuse University, taking the course in architecture. On leaving the university in 1910, he was engaged as a draftsman for several years in various architectural offices in New York City. In 1917, after some time spent as a designer for Todhunter in New York City, he entered into business with Mr. North, this business being devoted especially to the design and fabrication of mantels and hardware, particularly of the Colonial period. In this work he has achieved the distinction which talent and hard work merit—and which they don't always get.

Have you ever noticed, in the drawings of Howard

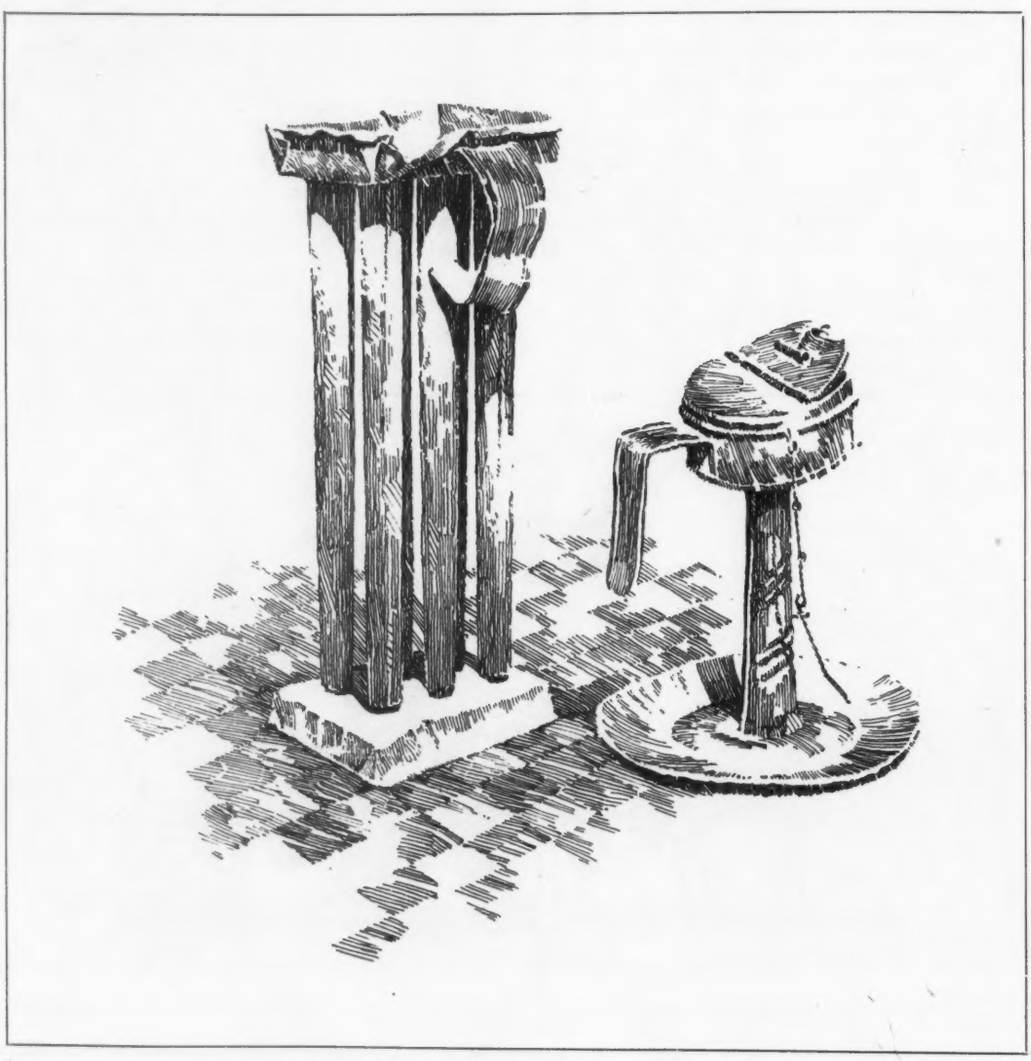


STUDY FOR A WEATHER VANE

Pyle, how thoroughly he understood the use of accessories? If the drawing be one representing three 16th Century pirates in a boat, even the water barrel in the foreground is sure to be a proper 16th Century water barrel. Pyle's work is surprisingly free from the anachronisms which are so frequent in the work of many others. If the pirate chief, Blackbeard, is smoking a pipe, it is a pipe such as was used in 1725. The knowledge implied in the correct use of accessories means not only that Pyle possessed an active memory but it implies a direct contact with the accessory itself. Pyle had the 16th Century water barrel and he had the 1725 pipe *in his studio*. He didn't guess: he knew.

One feels that Mr. Arnold knows his Colonial detail and Colonial accessories similarly. In his drawings such as that on page 854, showing a Colonial interior, one feels instinctively that the hardware, which the drawing is designed to illustrate, is authentic. In all the charming drawings of door-latches, hinges, bolts and what not, one feels that they were drawn by someone who knows how they were fashioned and how they operated. And the result of this knowledge is the unobtrusive assurance with which the high-lights and black values are placed.

This conscientiousness runs through Mr. Arnold's drawings and is noticeable in his handling of detail throughout. In no other medium, I suppose, are the variations of technique more apparent than in pen and ink. Every drawing has the defects of its qualities. The overemphasis of the sweeping line in Railton's later drawings of foliage; the overdone and inanimate quality of some of Griggs' work; the looseness of some of Pennell's work;—these are disturbing—but not in such measure as to outweigh our gratefulness for their happier work. Such criticism is not faultfinding: it is a simple recognition of the fact that what we gather with one hand we lose with the other, all too often. To catch the sunlight may mean the losing of something else. To give the formation of the bark of an old oak it may be necessary to sacrifice something of the mystery of the tree as we behold it in nature. All drawing is analytic and every analytic process, in giving us something specific, eliminates the vague and indefinable sense of wholeness which we gain in contemplating, as it grows, even a blade of grass.



STILL LIFE DRAWING BY J. I. ARNOLD—REPRODUCED AT ORIGINAL SIZE

STUDY OF CANDLE MOLDS AND AN EARLY AMERICAN TIN LAMP

THE GEOMETRY OF ARCHITECTURAL DRAFTING

13—PLOTTING OF EXTRANEOUS ANGLES

By Ernest Irving Freese

EDITOR'S NOTE:—*This article, which is copyrighted, 1930, by the author, continues the series begun in August, 1929.*

ANY ANGLE demands two lines for its graphical representation. If you draw but one line on the board —a horizontal, or a vertical, or an oblique—you have *not* pictured an angle. If you draw a second line in any direction other than parallel with the first—and either in touch with the first or removed from it—you *have* pictured an angle. The two lines are its *sides*. The common point to which these lines converge, whether this point be on or off the board, is the *vertex* of the angle. Now, if you draw a circle—*any* circle—about this vertex, or imagine such a circle as being so drawn, then the *measure* of the angle is that fractional part of one complete *revolution* that is intercepted by the sides of the angle. However, it is not my intent to here dwell *unduly* upon such revolutionary measures, but just to state that a plotting Babylonian astronomer once conjured up a number that is evenly divisible by more numbers than some other numbers he thought of. It's 360. Being such a roundabout number, it just naturally put a stop to all further contemplation of a revolutionary character until, *by degrees*, it came to be accepted as the unchangeable standard to which all protractors and tabulated trigonometrical functions now conform. So now, since I have unquestionably gone on record as cognizant of the fact that an angular "degree" is not a measure of *length* but is, instead, a three-hundred-and-sixtieth part of a *revolution*, we can, forthwith, proceed on our geometric way equipped with the requisite mutual understanding.

If one side of an angle is given, and the other required side can be materialized solely by direct manipulation of the sliding instruments operating either singly or in combination, the resultant angle is an "inherent" one; hence, requires no angular measurement or "plotting." The full range of these angles, and the set-ups required to produce them, have heretofore been shown at Diagram "1" of Figure 109 in Part 12, where they are referred to the horizontal as a base, and at Figure 56 in Part 6, where they are referred to a given extraneous line as a base. Angles other than these are extraneous to the instruments. In other words, an "extraneous" angle is one that is *not* a multiple of 7½ degrees. A few of these, as has been shown at Figure 110 in Part 12, are readily constructible with the compass. In general, however, any extraneous angle must be plotted, or laid out, by one or another of the methods in this Part presented.

Figure 115 acquaints you with some excellent protracting methods of general application in cases where the required angle contains a whole number of degrees or a fraction thereof that can be exactly obtained, or that can be accurately estimated, from the graduation marks of the instrument. Diagram "1" emphasizes the seldom-realized fact that the angle *ABD*, with vertex on the *circumference*, is always one half of the central angle *ACD*. Diagram "2" utilizes this advantage to procure a longer line, *BD*, than would otherwise be the case, as well as to avoid estimation of the ¼ degree which, in a protractor reading to half degrees, would otherwise become necessary. The longer base, *BA*, for alignment with the given line, also makes for greater accuracy in the *placement* of the protractor. It is evident that angles expressible in *quarter* degrees can thus be exactly laid off with a protractor graduated only to *half* degrees, and, similarly, that angles to *eighth* degrees

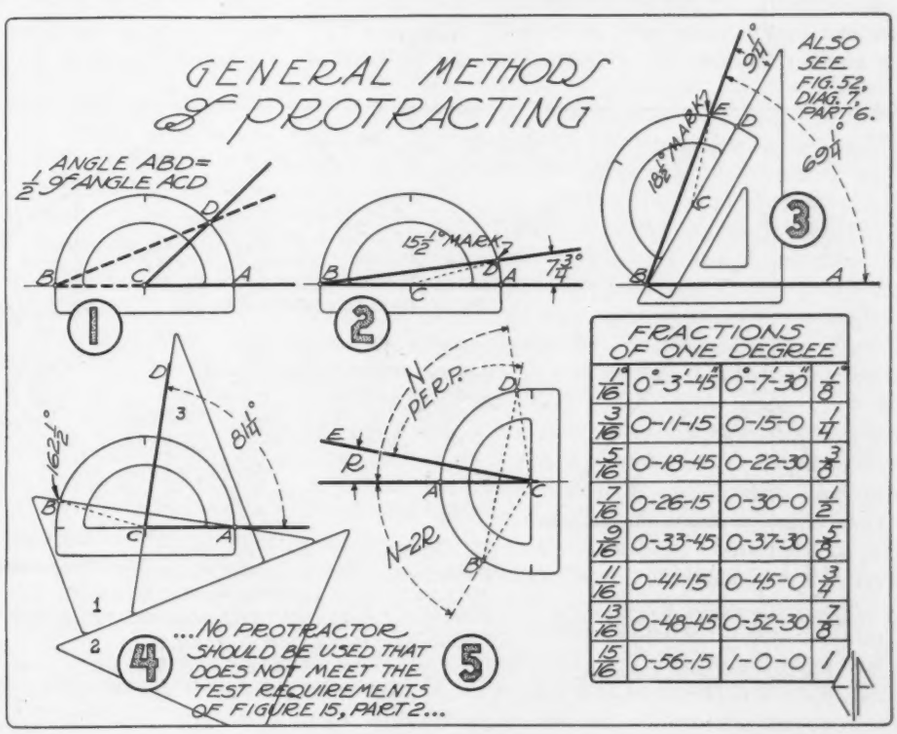

GENERAL METHODS OF PROTRACTING
ANGLE ABD = ½ OF ANGLE ACD
ALSO SEE FIG. 52, DIAG. 7, PART 6.
FRACTIONS OF ONE DEGREE
...NO PROTRACTOR SHOULD BE USED THAT DOES NOT MEET THE TEST REQUIREMENTS OF FIGURE 15, PART 2...

FIGURE 115

can be marked off from a protractor containing *quarter*-degree graduations. Moreover, in the one case, an eighth degree could be accurately estimated, and, in the other case, a sixteenth of a degree could be so estimated; for, in either case, by using the method shown at Diagram "2," *the angular indication on the protractor is twice the angle required.* Hence, in all cases, place the protractor with its mark *B* at the vertex of the required angle instead of there placing its central point *C*. Then mark off from *A* to *D*, exactly *twice* the number of degrees required. The line *DB* will then make the *required* angle with *BA*, as shown. Where the required angle exceeds, say, 30 degrees, some such combination as shown at Diagram "3" can be advantageously employed. Here, the "inherent" angle of 60 degrees has been subtracted from the required angle of 69¼ degrees, and the difference of 9¼ degrees laid off from the 60-degree line as a base, in the manner indicated. In a similar manner, *any* inherent angle can be used to reduce a required angle to one that will yield a longer line for more accurate prolongation. Diagram "4" shows another useful expedient not only to avoid quarter-degree estimation, but also to allow of the required line *CD* being projected as a perpendicular to the imaginary chord *AB*, through the one central point *C*. Obviously, it consists in merely doubling the central angle on the *protractor*, and then bisecting it by the well-known instrumental combination there indicated. The line *CD* can thus be accurately projected to any length required. This method is particularly suitable to wide angles and small protractors, and, *provided the protractor is accurate*, is productive of results as accurate as any other method. *No* protractor, however, should be used that does not meet the rigid test requirements heretofore enumerated and fully explained in the latter part of Part 2. Diagram "5" is another instance of a method similar to that of Diagram "4": the variation indicated at Diagram "5" being particularly applicable and suitable to exceedingly acute angles. Here, with the protractor placed in the position shown, but this time with its central point *C* at the vertex of the required angle, indent the point *D* any number of degrees, *N*, from *A*—preferably about 90, as shown. Then indent another point *B* such that *AB*, in degrees, equals *N* minus twice the required angle *R*. Then the required line *CE* becomes a perpendicular to the imaginary chord *BD*, and can be instrumentally projected in the same manner as the line *CD* of Diagram "4." The only advantage this method has over the method shown at Diagram "2" is that the required line *CE* of Diagram "5" can be projected through the *one* point at the vertex, whereas, the required line *BD* of Diagram "2" must be projected through the *two* points *B* and *D*. (See Figures 55 and 53, respectively, in Part 6.) The table given in Figure 115, herewith, will undoubtedly prove of value in converting minutes and seconds into fractions of a degree for protracting or otherwise laying off a given angle. If the required angle contains any combination of minutes and seconds not found in this table, other means than the protractor should be employed to plot same. A difference of 10 seconds, however, can be neglected without any difference becoming detectable in the resultant inclination of any line limited by a six-foot drafting-board! If a required angle calls for, say, 17 degrees, 45 minutes, 10 seconds—it can safely be laid off as 17¾ degrees. You will seldom find, however, even on surveys, any angle reading to less than a quarter of a minute.

At Figure 116, the approved "engineering" method of plotting angles by trigonometry is given. It requires the use of readily-procurable tables of "natural trigonometrical functions." Diagram "1" is a graphical representation of the functions made use of in this

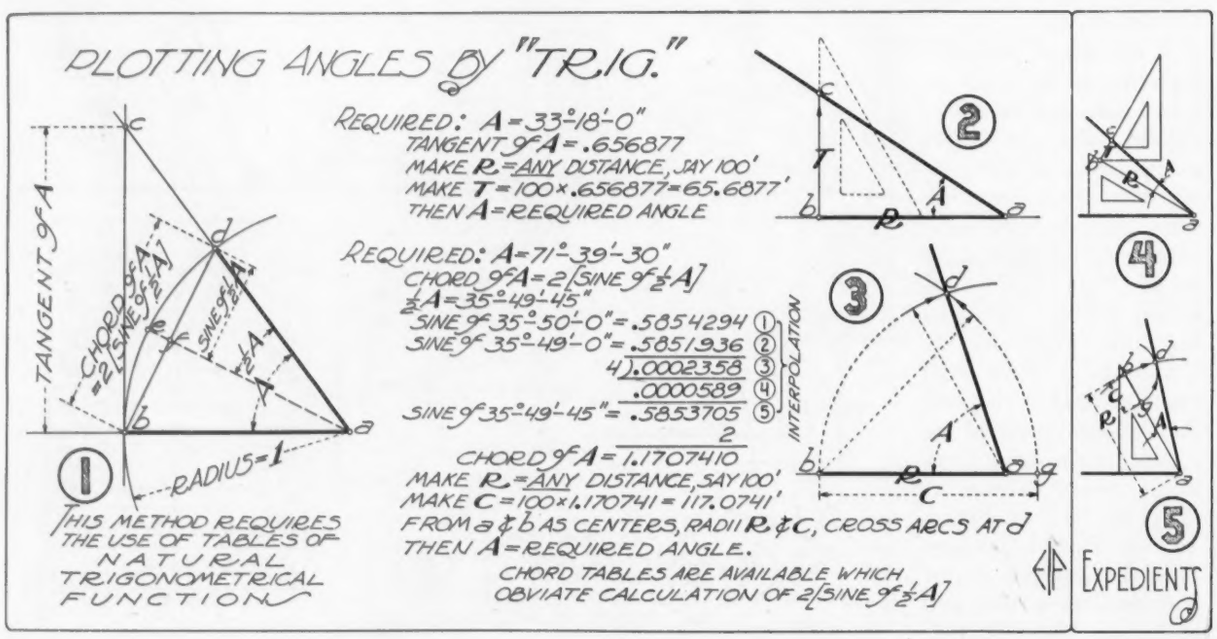

PLOTTING ANGLES BY "TRIG."
REQUIRED: A = 33°-18'-0"
TANGENT ½A = .656877
MAKE R = ANY DISTANCE, SAY 100'
MAKE T = 100 × .656877 = 65.6877'
THEN A = REQUIRED ANGLE
REQUIRED: A = 71°-39'-30"
CHORD ½A = 2[SINE ½A]
½A = 35°-49'-45"
SINE ½ 35°-50'-0" = .5854294 ①
SINE ½ 35°-49'-0" = .5851936 ②
4].0002358 ③
.0000589 ④
SINE ½ 35°-49'-45" = .5853705 ⑤
2
CHORD ½A = 1.1707410
MAKE R = ANY DISTANCE, SAY 100'
MAKE C = 100 × 1.170741 = 117.0741'
FROM a & b AS CENTERS, RADII R & C, CROSS ARCS AT d
THEN A = REQUIRED ANGLE.
CHORD TABLES ARE AVAILABLE WHICH OBVIATE CALCULATION OF 2[SINE ½A]
TANGENT ½A
CHORD ½A = 2[SINE ½A]
SINE ½A
RADIUS = 1
THIS METHOD REQUIRES THE USE OF TABLES OF NATURAL TRIGONOMETRICAL FUNCTIONS
INTERPOLATION
EXPEDIENTS

FIGURE 116

method—the trigonometrical "tangent," *bc*, of the required angle, *A*; and the trigonometrical "sine," *fd*, of *half* the required angle. The Diagram makes it plain that the "chord," *bd*, of the required angle, *A*, is equal to *twice* the sine of *half* the required angle. Hence, with the aid of the aforementioned trigonometrical tables, the chord of an angle can readily be determined from that formula; though chord tables are available which obviate even this simple calculation. Diagrams "2" and "3" show two examples worked out by this system: one utilizing the "tangent," or perpendicular *bc*, and the other utilizing the chord *bd*—the actual *lengths* of said tangent and chord being determined by multiplying the aforementioned tabulated *ratios* by the actual *length* of any assumed radius, *R*. The process is so clearly set forth in this Figure as to require no further explanation except, perhaps, the manner of interpolating values not given in the usual tables. These tabulated values ordinarily read to any number of *minutes* required, but the functions for angles containing fractions of a minute, or *seconds*, must be found by "interpolation." This is invariably done by simple proportion, that is, by assuming that the arc subtended by an angle of *one minute*, or sixty seconds, is a straight line—certainly a *practical* assumption! The general process of interpolation then becomes as follows, referring to the actual example given at Diagram "3": Set down the tabulated functions, items 1 and 2, of the two nearest angles *between which* the required angle occurs. Take their difference, which is item 3. Now consider this difference as the corresponding function of 1 minute. This is pure fiction, but it clarifies the process. In other words, in the example, if this difference, which is item 3, is the sine of 1 minute, or 60 seconds, then the sine of ¼ minute, or 15 seconds, will be ¼ of item 3, which is item 4. Hence, this difference, which is the sine of 15 seconds, *subtracted* from item 1, will result in item 5, which result is the interpolated sine of the *required angle*. The same result would have been attained by taking 45/60ths, or ¾, of item 3 and *adding* it to item 2, but in this case the route chosen is the shortest. In laying off the linear values required by this method of plotting angles, the decimal scale should be used. Even so, it is clearly out of the question to lay off a distance to the number of decimal places shown. But the greater the proportionate distances used, the greater will be the accuracy of the result. For angles up to, say, 45 degrees, the "tangent" method will prove satisfactory. Beyond this, because of the length of tangent required relative to the length of radius, it is apt to become clumsy or entirely unwieldy. The method by "chords" then becomes preferable—though in this method the beam compass may have to be used to swing the necessary arcs. By means of the expedients suggested at Diagrams "4" and "5," however, space may be saved and the big decimals made more manageable. These expeditious combination methods are fully set forth by the Diagrams referred to.

Now I am going to show you an entirely new and general method of plotting *any extraneous angle whatsoever* with no instruments except your three triangles and your scale. You will not need a protractor, nor any trigonometrical tables. But you will have to do a little simple preliminary arithmetic. And once you "get the hang of it"—you'll sit up nights doing it just for fun! This method is merely a workable system of *graphical* interpolation, that does away with decimal measurement entirely and gets the laid off distances into *integers*—whole numbers. And the results are so accurate that the "theoretical" deviation is graphically non-detectable within the limits of any drafting-board ever used. Applications of this method have already been shown in Part 12, at Figure 112, in laying out the central angles of the polygons of 17, 13, 11 and 7 sides. Now refer to Figure 117, herewith. The four worked-out examples are given in full to remove all doubt as to the method of interpolation for any angle whatsoever, whether expressed as a fraction or as degrees, minutes, and seconds. The method is invariable. There are no exceptions. In the first example, at Diagram "1," let it be required to lay out an angle of 4 degrees, 10 minutes; one side, *AB*, being given. On a convenient scratch pad, set down the required angle and reduce it to a fraction, which is 4 1-6 degrees as shown. Below this, set down the two angles nearest to 4 1-6 degrees that can be produced with the triangles. The interval between these two "inherent" angles will then be 7½ degrees—always—and the *required* angle will lie somewhere between. We shall see. In this case, the two nearest inherent angles are 0 degrees and 7½ degrees, as set down in the Diagram. Draw a line beneath these and then set down the difference between each and the given angle, resulting in the numbers 4 1-6 and 3 2-6, as shown, and maintaining the fractions to the same denominator. Now consider these two numbers, *whatever they may be*, not as angles, but as the *terms of a proportion*. Then reduce this proportion to integers. For example: 4 1-6 is to 3 2-6 as 25 is to 20—which is merely the process of determining the numerators of their purely fractional forms. But 25:20 is further reducible by the common divisor 5, resulting in the final numbers 5 and 4, as shown. Circle these numbers with your pencil, and continue the circles as *crossed lines* to the two inherent angles first set down above the horizontal line. These hieroglyphics are merely to remind you that the number of units at the lower end of either crossed line is to be laid off at the inherent angle indicated at the upper end of the same line, and that, from the point thus fixed, the other number of units is to be laid off at the other inherent angle—each inherent angle being referred to the given line as a base. Now let's do it: From the given vertex *B*, on the given line *AB*, lay off any 4 units at 0 degrees to the given line—which is *on* it, in this case—thus fixing point *C*. From *C*, lay off 5 of the same units at 7½ degrees to the given line, thus fixing *D*. The line *BD* then makes the required angle with the given line *AB*. Note that the two inherent angles between which the required angle is

interpolated, are always referred to the given line *AB*, and that it makes no difference at all whether one or the other is laid off first: the point *D*, establishing the required angle *ABD*, will always come at the same place because the required line *BD* is the diagonal of the parallelogram of graphical interpolation. You will readily discover this by laying off the required angle *both* ways from the same vertex, from which the line *BD* will actually be *seen* as this diagonal. This system, evolved by the author and consistently used in his own drafting-room, is actually the most accurate practical method of laying off angles that has so far been invented. It can be mastered in ten minutes, and is unforgetable once the easy arithmetical preliminaries are understood. The symbols used in the Diagrams can then be dispensed with, though their use avoids any possibility of confusion. At Diagram "2," the required angle lies between two inherent obliques, rather than between the given line and one oblique. Diagram "3" shows the process by which the central angle of the tridecagon shown at Diagram "2" of Figure 112 in Part 12 was determined—1-13th of 360 degrees. At Diagram "4," the required angle runs to *seconds*, but the process is exactly the same. In this case, however, the final irreducible units are further divided by 12, thus getting the proportion in terms of *feet and inches*, as indicated, and rendering the distances easy to lay off at any suitable drafting scale. Of course, the units 499 and 401 could just as readily be laid off with the decimal scale. The results would be the same: it would not change the angle so long as the *proportion* between the units remains unchanged. The point is: the final units used can *always* be gotten into such form that they can be *exactly* laid off to any convenient or suitable scale. The only departure from "theory," in this practical method of laying off angles, is the assumption that *one* of the forty-eight 7½-degree sectors of a circle is a *triangle*. The departure from practical exactitude is nothing. In fact, since the bisector of a 7½-degree angle is also the bisector of its arc, the method is also *theoretically* exact for every angle that is a multiple of 3¾-degrees.

At Diagram "5," of Figure 117, a practical method of "scaling" any angle is shown, which also can be applied to the laying off of any required angle when the number of degrees, whole or fractional, is expressible in a number which, *considered as inches*, could be accurately laid off at some convenient scale. This is how: Let *BAE* be an angle, not exceeding 60 degrees. You want to measure this angle *with the drafting scale*. All right: At *any* convenient scale, the larger the more accurate, draw the arc *BE* with a radius of 5′-0″, and, on a 30-degree line through *A*, make *AC* equal 9′-11″ at the same scale. Draw a short line from *E* directed to *C*, and cross this line at *D* with a 60-degree line from *B*. Now, measure *BD* in *inches*, at the scale used. Call these inches *degrees*. That's it! Now, if the angle to be measured *exceeds* 60 degrees—the angle *BAF* or *BAG*, for instance—then first cut off 60-degree chords with the same 5′-0″ radius until the remainder *BAE* becomes *less* than 60 degrees. Measure this. Then add to it the number of degrees first cut off. Again: that's it! You can measure any angle whatsoever

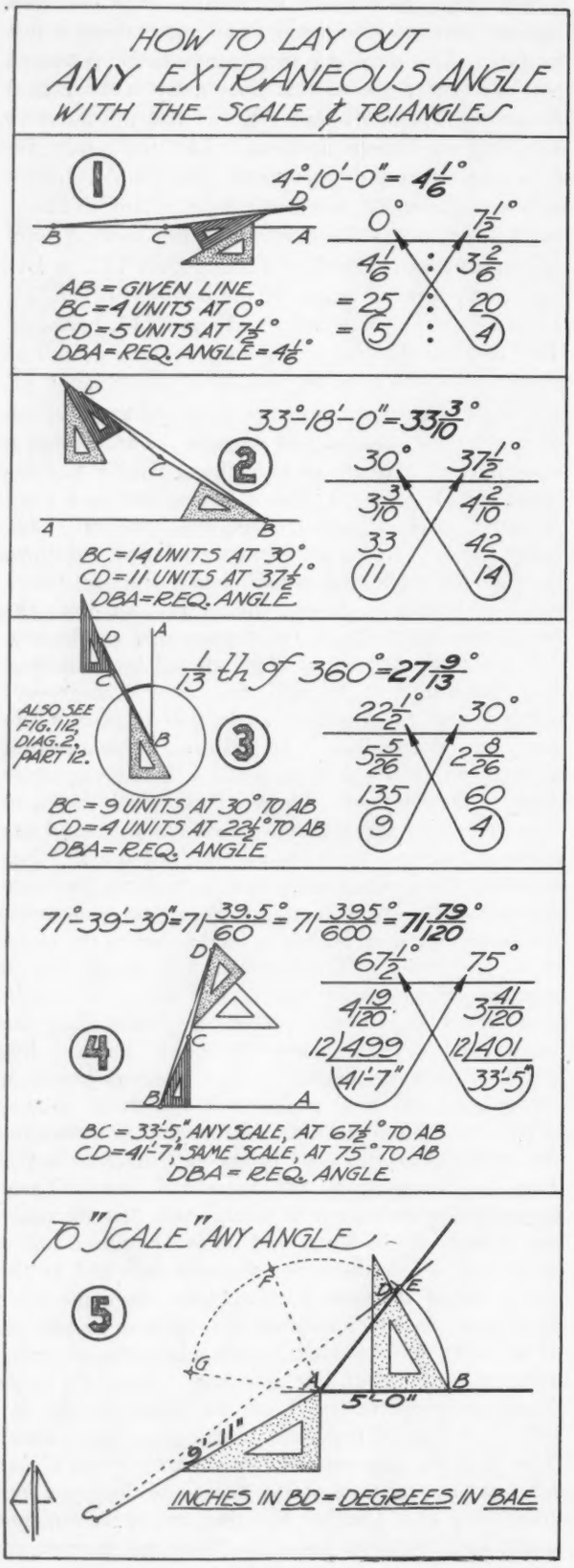

HOW TO LAY OUT
ANY EXTRANEOUS ANGLE
WITH THE SCALE & TRIANGLES
1
4°-10′-0″ = 4 1/6°
AB = GIVEN LINE
BC = 4 UNITS AT 0°
CD = 5 UNITS AT 7½°
DBA = REQ. ANGLE = 4 1/6°
0° 7½°
4 1/6 3 2/6
= 25 20
= 5 4
2
33°-18′-0″ = 33 3/10°
30° 37½°
3 3/10 4 2/10
33 42
11 14
BC = 14 UNITS AT 30°
CD = 11 UNITS AT 37½°
DBA = REQ. ANGLE
3
1/13 th of 360° = 27 9/13°
ALSO SEE FIG. 112, DIAG. 2, PART 12.
22½° 30°
5 5/26 2 8/26
135 60
9 4
BC = 9 UNITS AT 30° TO AB
CD = 4 UNITS AT 22½° TO AB
DBA = REQ. ANGLE
4
71°-39′-30″ = 71 39.5/60° = 71 395/600° = 71 79/120°
67½° 75°
4 19/120 3 41/120
12|499 12|401
41′-7″ 33′-5″
BC = 33′-5″ ANY SCALE, AT 67½° TO AB
CD = 41′-7″ SAME SCALE, AT 75° TO AB
DBA = REQ. ANGLE
TO "SCALE" ANY ANGLE
5
5′-0″
9′-11″
INCHES IN BD = DEGREES IN BAE

FIGURE 117

by this simple method with as much accuracy as you could read it off a protractor. Now I presume you wish to *lay off* an angle of, say, 52 degrees by this method. Merely reverse the above measuring process: Draw an arc of 5′-0″ radius at any suitable scale, and locate *C* at the same scale. On a 60-degree line from *B*, make *BD* equal 52 *inches*, which is the number of *degrees* required. Project *D*, collinear with *C*, to *E* on the arc. Then *ABE* will be the required angle of 52 degrees—and, if your work has been careful, no one can prove, *graphically*, that that angle is *not* 52 degrees. So there you are—another theory gone glimmering! But suppose the required angle *exceeds* 60 degrees. Well, first reduce it, arithmetically, by any number of 60-degree intervals that will leave a remainder *less* than 60. Lay *this* off. Then add, graphically along the arc from *E*, the number of 60-degree intervals originally subtracted. This graphical addition is merely the process of laying off 5-foot chords from *D* to *F* or *G*, as required.

Three cases are shown in Figure 118 in which the vertex of the required angle is off the board. At Diagram "1," *ab* is a given arc of known radius but with its center inaccessible. It is required to locate a point *d* removed any number of degrees, *A*, from the given point *c* on the arc. Here, *A* is the angle subtended by imaginary radials from *c* and *d*. Hence, the arc *cd* is the arc of the required angle, and the straight line *cd* is its chord. From a table of trigonometrical sines, find the sine of half the angle *A*. Multiply this by 2. Multiply the result by the known radius of the arc *ab*. This is the actual *length* of the chord *cd*. Hence, with this as radius, and from *c* as center, cross the given arc at *d*, which is the point required. This can also be found by purely geometrical means — but the method just given is the simpler of the two. The other, however, will be made known in connection with Diagrams "3" and "4." At Diagram "2," it is required to measure the given angle *A*, subtended by a given arc *cd* of unknown radius and inaccessible center. Through either given point, say *c*, draw a radial. (See Part 8, Figures 71 and 72.) From the other point, *d*, draw a perpendicular to this radial. Then the angle formed by this perpendicular and the chord *cd* is equal to half of the angle *A*, as indicated. In other words, twice the angle *cde* is the magnitude of the given angle *A*. The problem presented and solved in Diagrams "3" and "4" is one seldom encountered in practice; but it's interesting, and affords a most excellent test of your geometric *workmanship*. In each of these two Diagrams, the two given converging lines, *ab* and *cd*, form an angle, *G*, of which the vertex is off the board. It is required to determine the placement of another line, *pq* (of either Diagram), such that it will make a required angle, *R*, with *ab*, and, at the same time, be directed to the inaccessible vertex of the given angle *G*. Both Diagrams are solutions of the same problem, and carry the same reference letters. Here's the way to do it—and, as I say, it requires very careful workmanship: From any indented point, *e*, on *ab*, draw *ef* making the required angle with *ab*. Cross *ef* with any perpendicular thereto, *gh*. Project *e* to *m*, parallel with *cd*; and project *m* to *n*, parallel with *le*. (If the intersection at *n* becomes too acute for accurate definition of this point, then use one of the "detective" methods heretofore given at Figure 65 in Part 7 to locate *n*.) Now make *nn′* any multiple of *jn*, and make *kk′* the same multiple of *jk*. Then project *e* to *o*, parallel with *n′k′*, and, through *o*, draw *pq* at the required angle (parallel with *fe*). The line *pq* is the line required, converging to the same inaccessible vertex as the sides of the given angle *G*, and making the required angle *R* with the line *ab*. Now, if no trigonometrical tables were at hand, you could use the above method to lay off the angle, *A*, of Diagram

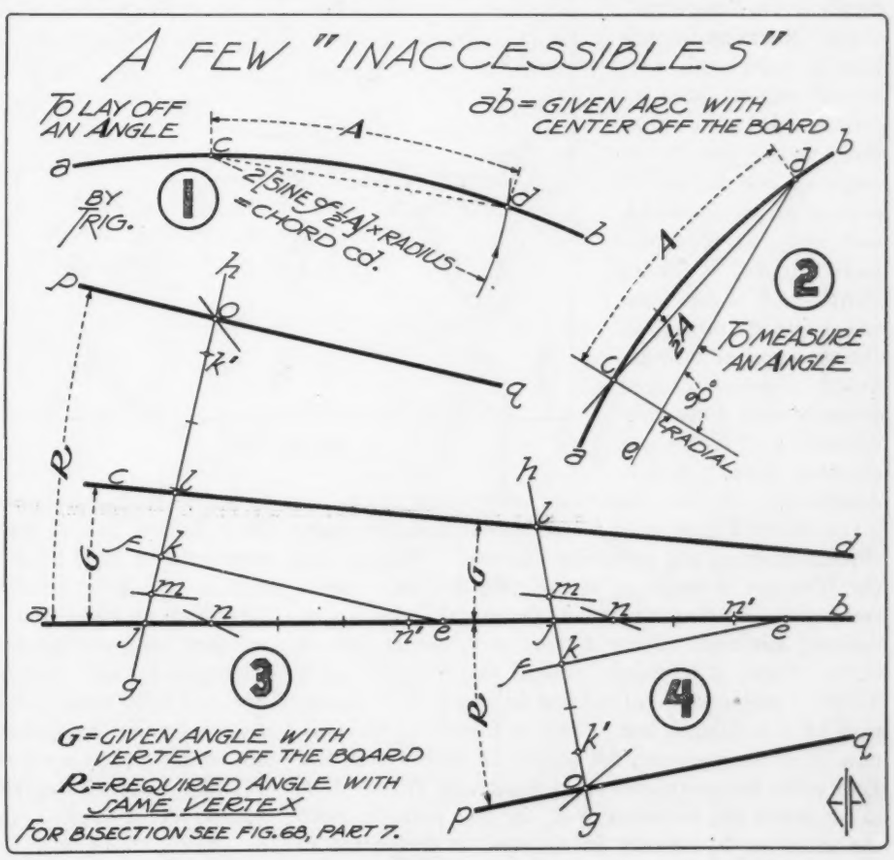


FIGURE 118

"1," by drawing a radial through *c*, and a second one anywhere you choose, and then using these two radials to locate a third radial which would cross the arc at *d* and correspond with the line *pq* as found at Diagrams "3" and "4."

Figure 119 shows the surveyor's method of measuring and recording angles by reference to the north and south "meridian." This shows very clearly that the angle contained in the descriptive "bearing" of a line is merely the angular deviation of that line from the meridian, and should clear up the confusion which architectural draftsmen often exhibit in laying out plot plans from data furnished by the surveyor. We shall now do a little surveying ourselves—so as to get the surveyor's "system" thoroughly imbued in *our* system, and thereby rout the last vestige of said confusion:—

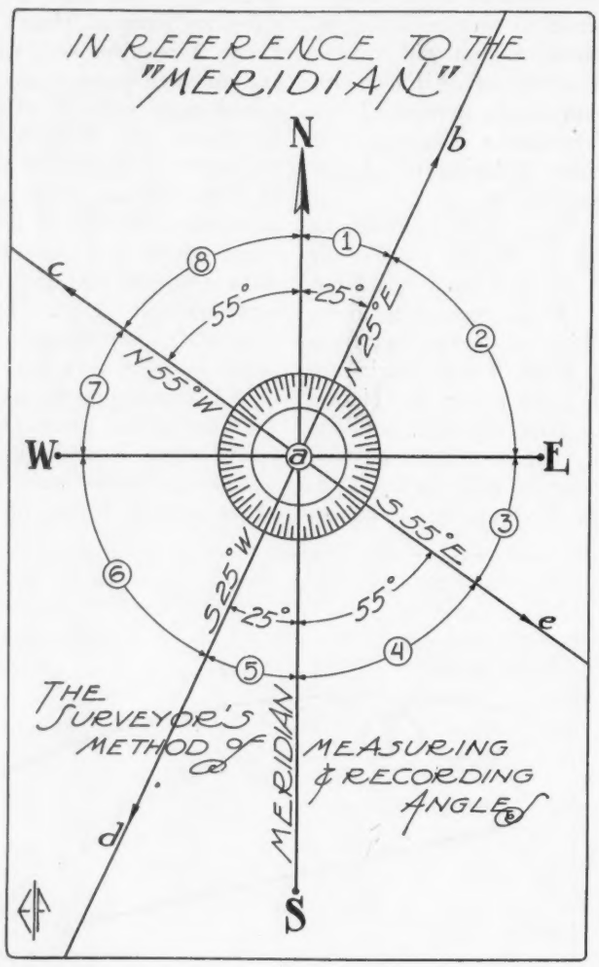


FIGURE 119

Set up the transit at station *a*, Figure 119. Swing the telescope into line with a stake at *b*. From the compass, read off the angle between the line of survey and the needle. It's 25 degrees. The compass needle is the "meridian"—the North-and-South line to which all surveyed angles are referred. Hence, since the line *ab* lies at an angle of 25 degrees *in respect to the meridian*, and since, as the compass shows, it bears North and East *from the point of survey, a*, the *direction* of the surveyed line becomes properly and fully designated as "*North 25 degrees East*," which designation, in the customary abbreviated form, is given in the Figure as it would appear upon the subsequent draft of this particular "survey." Now swing the telescope through an arc of 180 degrees—half a revolution—so that it points in the exactly *opposite*, or reverse, direction. Place a stake at *d*, on the line of sight. Now, it is plainly evident that the line *ad* is merely a prolongation of the line *ba*, or, in other words, that *bd* is a straight line. Yet, in respect to the position, *a, of the surveyor*, the portion *ab* bears North and East while the portion *ad* bears South and West. But, in respect to the *meridian, N-S*, the two portions make the same *angle*, namely 25 degrees, as designated in the Figure. Similarly, the line *ce* is one line through the transit-position *a*. Yet, in respect to *a*, *ac* bears North and West, while *ae* bears South and East; but, in respect to the unchanged meridian, each makes the same angle of 55 degrees. You can now see why the "bearings" of the opposite sides of a surveyed parallelogram are always the reverse of one another in spite of the apparently-contradictory facts that said sides are *parallel* and bear the same numerical angle: the lettered "bearings" refer to the direction in which the surveyor *looked* along each line in the changeable course of the survey, but the numerical *angles* refer to the assumedly-fixed meridian. One surveyor may survey a certain plot of ground by starting at a certain corner and moving around to the right. Another surveyor may survey the same plot of ground by starting at the same corner and moving around to the left. The corresponding plotted lines of the two surveys would carry exactly opposite bearings, but the *angles contained in those designations would be the same*—or, rather, they would be the same if any *two* surveyors could read a compass alike!—or if any *one* surveyor could read the same angle twice, *alike*. These qualifying "ifs" have no bearing whatsoever *relative to the meridian*. I can't understand why they were even mentioned. A quite recent survey of this particular field, Figure 119, along the lines there laid down, leads me to again approach the subject from another angle—*several* other angles, in fact. You have, no doubt, discovered the remarkable fact which Mr. Euclid has a prior copyright on—that when two straight lines cross one another they form four angles. So have I. And I have also discovered the fact that, of these four angles, the ones *opposite* one another are *equal* to each other. So have you. So has *anybody* who ever drew a geometric X for exercise—or otherwise. Look again at Figure 119. The angles *1* and *5* are equal; *2* and *6* are equal; *3* and *7* are equal; and so are *4* and *8*. Hence, since the angles *5* and *6* total 90 degrees, you could, by knowing the magnitude of angle *1*, deduce the magnitude of angle *6*. Well, that's how to *apply* your knowledge—else your discovery, and my discovery, and anybody's dis-

covery, of Mr. Euclid's proposition that when two straight lines cross one another they form four oppositely-equal angles—don't amount to much; just an X-ercise. Again, consider for the moment, any straight line, say the meridian line *N-S* of Figure 119. The line *bd* crosses it at an angle of 25 degrees. Is there, then, any doubt about the fact that the angle *baS* is 180 degrees *minus* 25 degrees? Can't be. All right, then you know this, too: when two straight lines cross one another, any two adjacent angles, of the four angles thus formed, sum up to 180 degrees. Two angles are "adjacent" when they have a common vertex and a common side. So, if the magnitude of the angle *Nac*, say, were known, you should exhibit no hesitancy whatsoever in finding the number of degrees in the angle *Nae*, or the angle *caS*. In fact, from the *two* angles, *1* and *8*, given in this Figure, every other numbered angle is made determinable. Or, now getting right to the point, if the "bearings" of but the *two* lines *ab* and *ac* were given, you should now be able to tell the angle which *any line of the Figure makes with any other line*. Now you are ready to lay out that plot plan of Mr. So-So's property from the data that just came in from the surveyor's office. You know the property well—it fronts on *Easy Street:*—

Figure 120, at Diagram "1," shows you how. This is the method the surveyor himself uses. It eliminates all likelihood of *accumulated* error, since all angles are laid off directly from the designated bearings of the lines in respect to the meridian, which latter becomes either a vertical or a horizontal line on the drafting board (whichever appears the more convenient), through the particular point of the survey from which the angle dates. In other words, each corner of the plot becomes the *vertex* of the required angle, and the "meridian" becomes one given *side*. The meridian need not necessarily be an actually drawn line—it can be an imaginary one. In the Figure, however, lines representing the four cardinal points of the compass are shown through each "joint" so as to render misunderstanding difficult. Say we start our layout at corner *1*. The survey shows that the bearing of the boundary line *1-2* is North and East, and that it makes an angle of 18 degrees and 20½ minutes with the imaginary meridian line through corner *1*. Hence, we have started our "plotting" in the same direction that the surveyor surveyed. If the line *1-2* had been designated as bearing South and West, instead of North and East, it would have indicated that the surveyor travelled around the property in the opposite direction. In which case, we would lay out the plot in the same manner, that is, by laying off the line *1-4* first. As it is, however, the direction *1-2* is the one here to follow. So, lay off the line *1-2*, from corner *1*, at the designated angle of 18 degrees and 20½ minutes in respect to the real or imaginary meridian drawn through this corner. On the thus-determined boundary line, now lay off the given distance *A*, as marked on the survey, and at the scale you have chosen for the plot

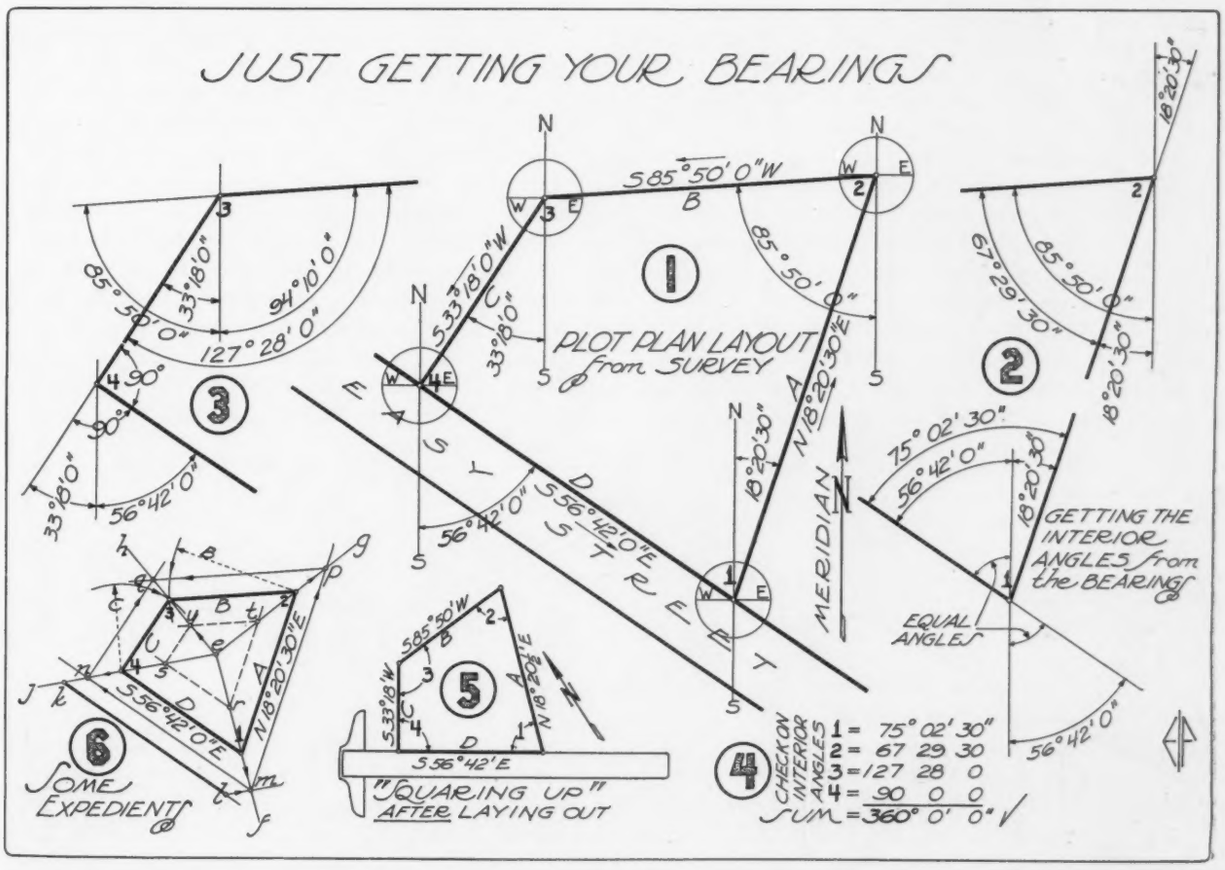

JUST GETTING YOUR BEARINGS
PLOT PLAN LAYOUT from SURVEY
GETTING THE INTERIOR ANGLES from the BEARINGS
EQUAL ANGLES
MERIDIAN
EASY STREET
CHECK ON INTERIOR ANGLES
1 = 75° 02' 30"
2 = 67 29 30
3 = 127 28 0
4 = 90 0 0
SUM = 360° 0' 0" ✓
"SQUARING UP" AFTER LAYING OUT
SOME EXPEDIENTS

FIGURE 120

plan. This brings you to corner *2*. Here, the designated bearing indicates that the boundary *2-3* bears South and West from corner *2*, and that it makes an angle of 85 degrees and 50 minutes with the meridian through said point. Lay this off. Then lay off the distance *B*—so corner *3* becomes fixed. In this manner, all lines of the plot should be determined. Always work directly from the given bearings, laying off the angles contained therein from the meridian as a base —*never* by laying off the angles between the actual lot lines. These actual angles should, however, be eventually marked on the finished plot, in order that the latter be replete with all available data. Now you can apply the knowledge of related angles which the previous discussion pertaining to Figure 119 contained. In other words, from the "bearings" given on the plot plan of Figure 120, you can "deduce" the magnitude of the interior angles, *1*, *2*, *3* and *4*. However, inasmuch as this is a practical and typical example, I have shown at Diagrams "2" and "3" of Figure 120, how these interior angles are procured. The process is mostly *mental*, but I've made it *graphic* so as to allow *you* to give it thought. Before you leave the four corners of this plot, as given at Diagrams "2" and "3," you should unravel, fully, the process by which those four interior angles are there arrived at. Possibly you know already. Then look at Diagram "4," which indicates the entirely *general* fact that the sum of the interior angles of *any* plane quadrilateral figure, such as the plot plan of Diagram "1," is equal to four right angles or 360 degrees. Hence, if your calculation, or deduction, of those four interior angles has been made correctly, this is a fair check. However, it is not an *absolute* check—since two or more *compensating* errors may have produced the same result. This, though, is highly improbable. If the closing side of the plot, say the side *4-1*, checks with the designated bearing and with the given dimension thereon, and if the *four interior angles* then sum up as 360 degrees, the layout may be accepted as correct! But, incidentally, *surveyors* have been known to be in error. So, if the careful laying-out above outlined will not stand the checking tests mentioned, the mistake is in the survey, not in your plotting of that survey. Now, assuming all's well, you can "square up" your plotted plan on the board with the street line or any other bounding line most appropriate for the final layout of the grounds and placement of the building outlines thereon. So you see, you must, in the beginning, allow yourself plenty of paper to withstand the eventual "trimming" of the squaring-up episode. Or else you can make the final plot as a tracing from the original—indenting all definitely-located corners with the point of the dividers before *tracing* the connecting lines. Diagram "5" shows the final plot all set for development, and with all available data thereon—lot line dimensions, bearings, interior angles, and the *meridian*. Diagram "6" indicates "some expedients" that you *might* have employed. Assume that the two sides, *1-2* and *1-4*, have been laid out. Then, by crossing two arcs of radii equal to the dimensions *B* and *C*, respectively, and with centers at the corresponding corners *2* and *4*, as shown, the intermediate corner, *3*, is fixed without the necessity of laying off the angular bearing of the two closing sides thus placed. Again, let the figure *1-2-3-4* be the plot submitted by the surveyor—usually drawn to a decimal scale. Plot plans of property development and landscaping must be drawn to a scale of feet-and-inches to be of any working-value. Well, mark any interior point, *e*, on the surveyor's plan, preferably, however, at the intersection of the bisectors of any two of its interior angles, as shown. From *e*, draw lines through all corners. At any point *k*, on one of these lines, draw *kl* parallel with one of the sides and make it equal to the length of that side at the scale you desire. Project *l*, parallel with *je*, to *m* on *ef*. Draw *mn* parallel with *1-4*, and draw *mp* parallel with *1-2*, crossing the radials *ej* and *eg* at the new corners *n* and *p*, respectively. Through these corners draw lines paralleling the other two sides of the survey and meeting at *q*, which point, if your projection has been accurately done, will fall on *eh* as shown. Then *mpqn* is the new plot drawn at the scale you adopted for the initial line *kl*. Or, the new plot may have been the plan *rtus*, depending upon whether the process was one of enlargement or reduction. Obviously, the identical principle is applicable to the enlargement or reduction of any shape whatsoever. Caution: the expedients above described afford no check on the *surveyor*. They assume *his* layout as correct.

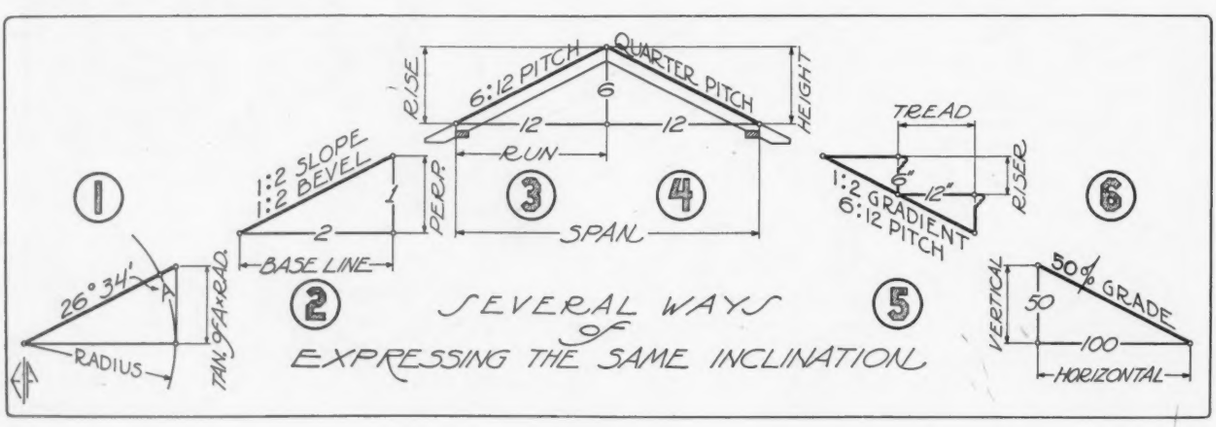
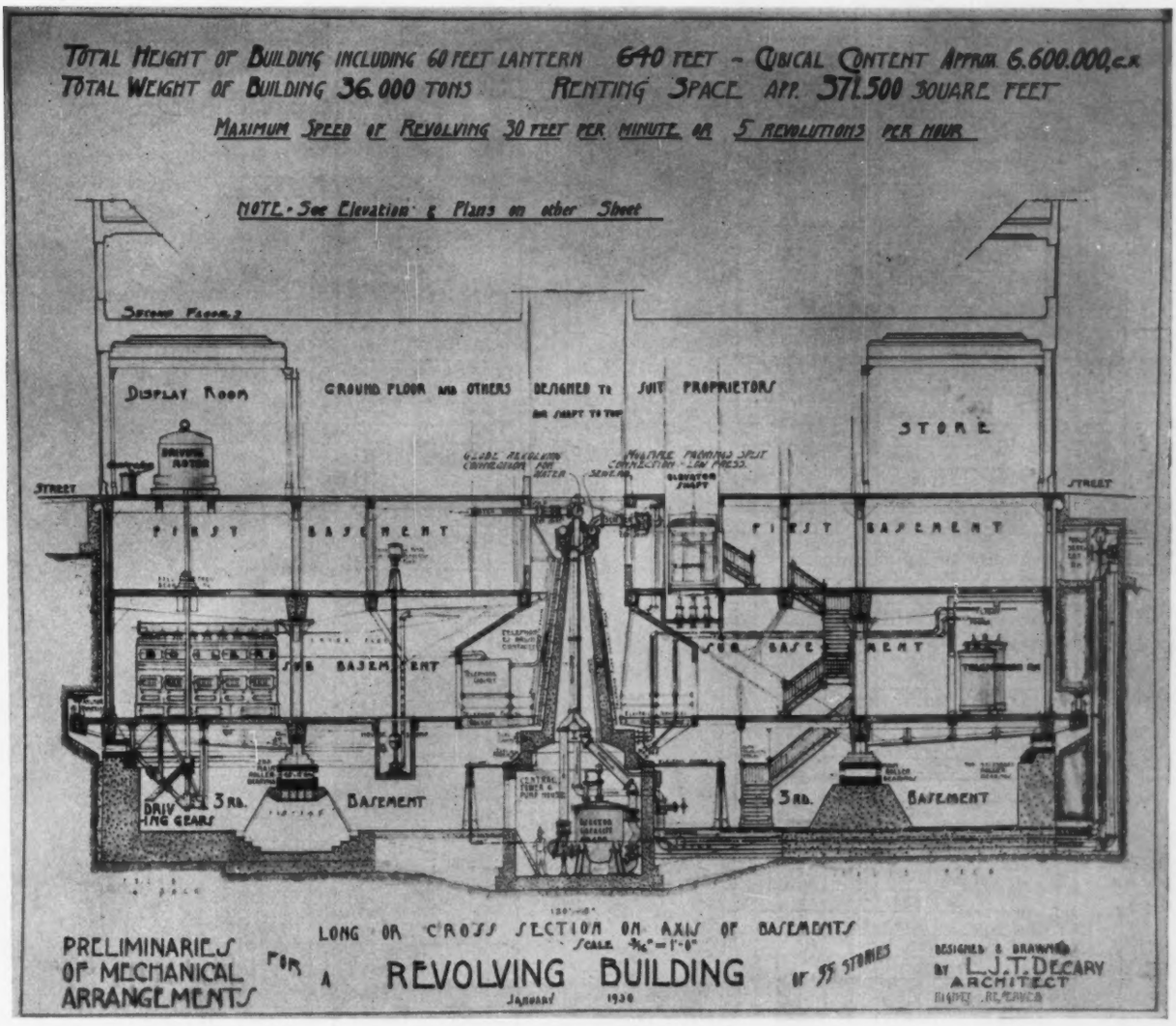


FIGURE 121

The six Diagrams of Figure 121 are a presentation of the various ways in which an angle, or the slope of one line relative to another, is expressed. It scarcely requires any discussion, except, perhaps, the old "carpenteresque" method of designating the pitch of a double-pitch roof, shown at Diagram "4." In this one peculiar instance, the pitch is expressed in terms of *twice* the run, that is, in terms of the span. In the instance shown, the height of the roof at the center of the span is one quarter of the span: hence, "quarter pitch." The term, however, is confusing, and should be avoided. Call it 6:12 pitch, as it is so designated at Diagram "3," that is, a vertical "rise" of, say, 6″ in a horizontal "run" of 12″. Roof pitches are not commonly given in degrees, but rather in terms of the steel square: a certain rise, in inches, for each foot of run. The particular roof pitch shown at Diagrams "3" and "4," corresponds to the angle designation of Diagram "1." The designation at Diagram "2" is used mainly in structural steel detailing. The "pitch" of a stairway is a "gradient," since it has to do with walking. And the slope at which a driveway deviates from level is its "grade." A slope referred to the *vertical* as a base is termed a "batter."


TOTAL HEIGHT OF BUILDING INCLUDING 60 FEET LANTERN 640 FEET - CUBICAL CONTENT APPROX 6.600.000 c.x
TOTAL WEIGHT OF BUILDING 36.000 TONS RENTING SPACE APP. 371.500 SQUARE FEET
MAXIMUM SPEED OF REVOLVING 30 FEET PER MINUTE OR 5 REVOLUTIONS PER HOUR
NOTE - See Elevation & Plans on other Sheet
DISPLAY ROOM
GROUND FLOOR AND OTHERS DESIGNED TO SUIT PROPRIETORS
STORE
STREET
FIRST BASEMENT
SUB BASEMENT
3RD. BASEMENT
DRIVING GEARS
LONG OR CROSS SECTION ON AXIS OF BASEMENTS
PRELIMINARIES OF MECHANICAL ARRANGEMENTS FOR A REVOLVING BUILDING OF 55 STORIES
JANUARY 1930
DESIGNED & DRAWN BY L.J.T. DECARY ARCHITECT

DATA CONCERNING A PROPOSED REVOLVING BUILDING

DESIGNED BY L. J. T. DECARY, ARCHITECT, OF MONTREAL

In plan this building is to be round for four stories in height. Above, it is to be composed of eight bays 40 feet wide and eight wings 52 feet wide for forty stories in height, crowned with a lantern of about ten stories in height. Advantages claimed:—No back elevations, higher rents, great novelty and curiosity, a material proof of the ingenuity and enterprise of Americans. What do you think of it?

SHEET Nº 2 — SCHEDULE OF ROOM FINISHES — JOHN SMITH - ARCHT. NEW YORK - N.Y. — JOB GENERAL HOSPITAL - HOPE - MAINE, DATE 3/8/29 MADE BY F.D. CHECKED BY L.J.

NUMBER	NAME	FLOOR: 1 WOOD	2 CEMENT	3 MARBLE	4 TERRAZZO	5 BRASS STRIPS	6 TILE	7 LINOLEUM	8 RUBBER	9 CORK	10 MASTIC	11 STAINED	12 ENAMELED	13
1	ENT LOBBY				X	X								
2	RECEPTION RM.							X						
3	CORRIDOR							X						
4	OFFICE		X										X	
5	EXAM. RM.							X						
6	CLOSET		X											

NUMBER	NAME	BASE: 14 WOOD	15 CEMENT	16 SANITARY COVE	17 MARBLE	18 METAL	19 TILE	20 HEIGHT	WALLS: 21 WHITE PLASTER	22 P.C.	23 MARBLE	24 WOOD	25 TILE	26 PAPERED	27 MASONRY POINTED UP	28 PAINTED
1	ENT LOBBY				X			8"	X							X
2	RECEPTION RM.				X			8"				X				
3	CORRIDOR		X					6"	X							X
4	OFFICE		X	X				6"	X							X
5	EXAM. RM.						X						X			
6	CLOSET		X					6"	X							X

NUMBER	NAME	WAINSCOT: 29 WOOD	30 MARBLE	31 TILE	32 RUBBER	33 KEENE'S CEMENT	34 HEIGHT	MOULDINGS: 35 CHAIR RAIL	36 PICTURE MOULD	37 WIRE	38 CORNICE	39 PANEL MOULDS.	40 WOOD	41 HOLLOW METAL	42 METAL CLAD
1	ENT LOBBY		X				3'0"			X				X	
2	RECEPTION RM.														
3	CORRIDOR							X	X					X	
4	OFFICE							X	X					X	
5	EXAM. RM.														
6	CLOSET														

NUMBER	NAME	CEILING: 43 WHITE PLASTER	44 P.C.	45 COVE	46 CORNICE (PLASTER)	47 BEAMED	48 PLASTER MOULDS.	49 PAINTED	50 SUSPENDED	51 ARCHED	52 SEGMENTAL	53 COFFERED	54	55	NOTES
1	ENT LOBBY	X			X		X	X							
2	RECEPTION RM.	X				X			X						Brown plaster behind wood paneling
3	CORRIDOR	X		X				X	X						
4	OFFICE	X		X				X	X						
5	EXAM. RM.	X		X				X	X						
6	CLOSET	X						X	X						

FIGURE 2

SHEET Nº 6 — SCHEDULE OF STAIRS — JOHN SMITH ARCHT NEW YORK N.Y — JOB GENERAL HOSPITAL - HOPE - ME. DATE 3/9/29 MADE BY F.D. CHECKED BY L.J.

NUMBER	LOCATION	GENERAL CONST.: 1 WOOD	2 STEEL	3 CONCRETE	WALL STRING: 4 CHANNEL	5 STEEL PLATE	6 " AND Ls	7 BENT STEEL PLATE	8 CEMENT	9 WOOD	10 MARBLE	11 TILE	12 SLATE
1	MAIN HALL		X			X					X		
2	SERVICE WING		X					X					
3	FIRE ESCAPE		X		X								
4	KITCHEN TO COURT			X					X				

NUMBER	LOCATION	OUTSIDE STRING: 13 CHANNEL	14 STEEL PLATE	15 " AND Ls	16 BENT STEEL PLATE	17 APPLIED MOULDINGS	18 MARBLE	19 TILE	20 WOOD	21 BOXED	RISERS: 22 STEEL PLATE	23 PANELED	24 MARBLE	25 TILE	26 CEMENT	27 RUBBER	28 OPEN
1	MAIN HALL				X		X			X	X	X					
2	SERVICE WING				X						X						
3	FIRE ESCAPE	X															X
4	KITCHEN TO COURT														X		

NUMBER	LOCATION	TREADS: 29 CEMENT	30 MARBLE	31 TERRAZZO	32 TILE	33 SLATE	34 MASTIC	35 RUBBER	36 STEEL GRATING	37 " SLAT	38 " NOSING	39	PLATFORM: 40 CEMENT	41 MARBLE	42 TILE	43 TERRAZZO	44 MASTIC	45 RUBBER	46 SLATE	47 STEEL GRATING
1	MAIN HALL		X																	
2	SERVICE WING	X									X		X							
3	FIRE ESCAPE								X											X
4	KITCHEN TO COURT	X																		

NUMBER	LOCATION	WALL RAIL: 48 WOOD	49 PIPE	50 ORN. IRON	51 BRONZE	52 BRASS	HANDRAIL: 53 WOOD	54 PIPE	55 ORN. IRON	56 BRONZE	57 BRASS	BALUSTRADE: 58 WOOD	59 DOUBLE PIPE	60 ORN. IRON	61 BRONZE	REMARKS
1	MAIN HALL				X					X				X		
2	SERVICE WING		X					X						X		
3	FIRE ESCAPE		X					X						X		
4	KITCHEN TO COURT		X													

FIGURE 3

FORMS FOR SPECIFICATION SCHEDULES FOR STAIRS AND ROOM FINISHES AS SUGGESTED BY LEONARD JOSEPH

(See text opposite)

SPECIFICATION SCHEDULES

THEIR USE AND ADVANTAGES TO THE ARCHITECT

By Leonard Joseph

SPECIFICATION SCHEDULES offer a simple but positive means of clarifying the architect's plans and specifications. When properly prepared they also save the architect much time in the preparation of his plans and specifications and, at the same time, give to the contractor the information he requires in unmistakable form.

On small operations the schedules are often placed directly on the scale drawings, occupying space on the sheet that is not otherwise required. On work of a more complicated nature, where there is not much repetition of plan units or where space on the drawings is not available, it is advisable to make separate sheets for the schedules.

In some of the larger architectural offices there are often as many as eight large sheets devoted entirely to schedules on a single operation. No operation is too small to benefit by the use of Specification Schedules and the need for them increases in proportion to the size and complexity of the building.

Four kinds of schedules have been commonly in use by the writer in his professional experience: Schedules for Doors, Room Finishes, Stairs, and Windows. Other schedules may suggest themselves to the architect as suited to his individual requirements. This article is not concerned with schedules covering work of a purely engineering nature, such, for instance, as steel column, lintel, and other types of engineering schedules. These the writer prefers to leave in the hands of the engineers concerned.

Door Schedules

The various doors included in any building—the different types of bucks, frames, transoms, hardware, saddles, etc.—offer many opportunities for errors on the part of the architect in preparing his plans and specifications and on the part of the contractor in estimating and carrying out his work. These, in turn, lead to misunderstandings and delays in the work.

Such errors and misunderstandings can be entirely or largely eliminated by the use of properly prepared door schedules.

Using the architect's schedule as a basis it is a simple matter for the contractor to prepare his shop schedules which are likely to require fewer corrections by the architect than usual. In fact, it is the practice of some offices when they have prepared door schedules not to check the contractor's schedules at all.

The small elevations of door types should show every type of door on the job. Special designs need not be shown, of course, these being taken care of in the "Remarks" column.

If the schedule forms are to be lithographed (see mention of this below), every type of door ordinarily used in the practice of the office should be shown.

The method of referring to doors by number is in common practice today. This practice is essential where door schedules are used. The numbers given to the doors should be indicated in a small circle or other similar device, placed close to the door itself. Hardware types should also be indicated by number, on the schedule.

The information given on the door schedule shown in Figure 1 is typical and is not intended to be complete for any particular office. Additional columns may be used to give information not given on this schedule. This applies to all schedules shown and not to the door schedules alone.

Room Finish Schedules

Indication of the finishing materials of the various rooms and the various portions of the rooms of a building is too often a source of annoyance to the architect, requires innumerable notations on the plans

SHEET Nº 1 — SCHEDULE OF DOORS — JOHN SMITH ARCHT NEW YORK N.Y. — JOB — DATE — MADE BY — CHECKED BY

DOOR TYPES — A FLUSH; B; C GL; D; E GL; F GL; G GL; H GL; I GL; J GL

\+ INDICATES STOP SIDE HINGE
X " "

NUMBER	LOCATION	SIZE	DOOR											FRAME										TRIM										TRANSOM				SADDLE					H'WARE	REMARKS
			TYPE	WOOD	HOLLOW METAL	METAL CLAD	STEEL PLATE	BRONZE	GLAZED	SINGLE DOOR	PAIR DOORS	PRIMED AT SHOP	BAKED FINISH	WOOD	PRESSED STEEL	H.M. COMB. BUCK & FRM	METAL CLAD	BRONZE	CHANNEL BUCK	PRIMED AT SHOP	BAKED FINISH	WOOD	HOLLOW METAL	METAL CLAD	MARBLE	TILE	PRIMED AT SHOP	BAKED FINISH	FIXED	HINGED	PIVOTED	GLAZED	CAST IRON	BRONZE	MARBLE	ANGLE IRON	RAISED	FLUSH		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
1																																								
2																																								
3																																								
4																																								
5																																								
6																																								

FIGURE 1—FORM FOR SPECIFICATION SCHEDULE OF DOORS AS SUGGESTED BY LEONARD JOSEPH

and causes frequent arguments among the subcontractors and consequent delays in the work.

With a properly prepared Room Finish Schedule these annoyances and delays are largely eliminated. The schedule shown in Figure 2 gives the information ordinarily required for this purpose. The advantages of such a schedule over the lengthy descriptions in the specifications and the customary notes on the drawings are too obvious to need comment.

It is advisable to give to each room or other division of the building a number by which the room may be referred to on the schedules. The room numbers should be placed in a small square or other device to distinguish them from the door numbers and other similar indications.

Stair Schedules

Stair Schedules are required only where there are a number of stairs of different types.

Where such variations exist the use of the Stair Schedule is an obvious aid to the architect and more particularly to the various contractors involved.

In preparing stair schedules each section of stairs between floors should be given a distinct number and the stairs should be so marked on the drawings. Thus, for a stairway that extended from the Basement to the Fifth Floor, the run from the Basement to the First Floor would be designated as Stair No. 1, the run from the First Floor to the Second Floor as Stair No. 101, from the Second to the Third Floor as Stair No. 201, etc.

Window Schedules

Where there are a number of different types of windows in a building the Window Schedule greatly assists the architect in furnishing the necessary information to the contractor and eliminates a fertile source of friction between subcontractors.

In preparing the Specification Schedules it should be borne in mind that they replace lengthy descriptions in the specifications and many notations on the drawings.

The more complete they are made, therefore, the better they serve their purpose and the greater their value to the architect and the contractors.

In writing the specifications for a job for which Specification Schedules are to be prepared, the schedules should be referred to whenever the work shown on them comes into consideration. For instance, where a stair schedule is to be prepared a clause under the specification heading of Miscellaneous Iron Work would read somewhat as follows: "All steel stairs, where shown on the drawings, shall be constructed in accordance with the drawings and specifications and the specification schedules." This same method of reference should be followed throughout the specifications.

The Specification Schedules form just as much a portion of the contract and are just as binding on the contractors as the drawings and specifications. Mention of this fact should be made in the General Conditions of the Contract.

The architect who has frequent occasion to use schedules would do well to have the schedule forms drawn on tracing cloth and then lithographed. Such lithographed copies should be printed on the coated or shiny side of tracing cloth. The notations and remarks for the individual job are then made on the dull side of the cloth, both sides showing up the same on the blue print. The object of this is to permit corrections on the sheet without disturbing the lithographed or "stock" material. Figure 1 shows a door schedule after lithographing but before filling in for the particular job.

Briefly, to sum up, the advantages of using Specification Schedules are:

They clarify the plans and specifications.

They save much time in preparing plans and specifications.

They keep many notations from the plans, making the plans that much simpler.

They avoid job delays by eliminating disputes between subcontractors.

SHEET Nº 5 — SCHEDULE OF WINDOWS — JOHN SMITH · ARCHT · NEW YORK · N.Y. — JOB · WILDER RES. · YONKERS · DATE 7/4/30 MADE BY L.J. CHECKED BY F.F.

NUMBER	LOCATION	TYPE: DOUBLE HUNG	CASEMENT · HINGED	" PIVOTED	FIXED SASH	VENTILATED SASH	SPECIAL		MATERIAL: WOOD	BRONZE	HOLLOW METAL	METAL CLAD	ROLLED STEEL	CAST IRON	GLASS: DOUBLE THICK.	SINGLE "	POLISHED PLATE	OBSCURE "	WIRE "	PLAIN "	DECORATED	SILL: TERRA COTTA	BRICK	CUT STONE	CAST "	MARBLE	METAL	STOOL: WOOD	MARBLE	HOLLOW METAL	METAL CLAD	GUARD: PLAIN IRON BARS	ORN. IRON	BRONZE	WIRE	INT·TRIM: WOOD	HOLLOW METAL	METAL CLAD	MARBLE	EXT·TRIM: CAST STONE	CUT STONE	TERRA COTTA	MARBLE	WOOD	HARDWARE	NOTES
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
1	RECEPTION RM.		X								X				X							X						X			X				X						X			13	
2	ENT. LOBBY				X					X											X	X																					X			1	
3	" "				X					X											X	X																					X			1	
4	STUDY		X								X				X							X								X		X					X					X			14	
5	KITCHEN	X											X		X							X						X						X											9	
6	"	X											X		X							X						X						X											9	

FIGURE 4—FORM FOR SPECIFICATION SCHEDULE OF WINDOWS AS RECOMMENDED BY THE AUTHOR

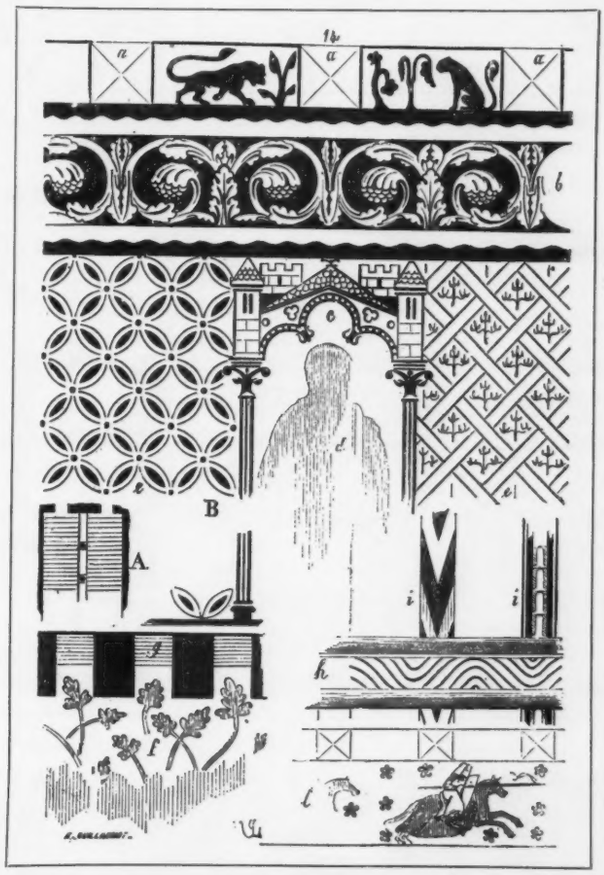
THE RICKER MANUSCRIPT TRANSLATIONS—11

VIOLLET-LE-DUC'S "RATIONAL DICTIONARY OF FRENCH ARCHITECTURE FROM THE ELEVENTH TO THE SIXTEENTH CENTURY," VOLUME VII

By Thomas E. O'Donnell

THIS VOLUME of Viollet-le-Duc's *Rational Dictionary of French Architecture* may, in some respects, be considered the most interesting of the entire set. The subjects that fall within it, through the mere coincidence of an alphabetical arrangement, are such as to make it especially attractive all the way through. Although there are only a little more than forty subjects treated, yet those are of such a nature, and of such importance that each is discussed at some length and effectively illustrated.

The translation reveals materials, not readily available, on such subjects as: the French *palace* of the Middle Ages in all phases of its development; French *half-timber* work, which has characteristics all its own; an exhaustive treatise on *painting*, as applied to architecture, during this period, a subject upon which there is but little available information; the *gable* in many interesting forms is explained and illustrated; the *pier*, especially as used and developed during the Romanesque and Gothic periods, is treated in every phase; the *pinnacle* in its varied and aspiring forms finds its place here; the *ceiling*, in construction, decoration, and detail also claims attention; an interesting and instructive account of *lead work* on roofs, gutters, and other exposed parts of buildings is given; the pont or *bridge* receives special attention of Viollet-le-Duc, thus indicating the importance of the bridge at this point in French history; *portals* and *porches*, especially those of the type developed in the finer churches and cathedrals, are given considerable space and well illustrated; following this there is an exhaustive and analytical study of architectural *profiles* of great variety; the *portico* and *balcony* are also given consideration; and the volume closes with an interesting account of the well and *well-curbs* of the Middle Ages. All of these are accompanied, in the original, with well selected and finely engraved illustrations, examples of which accompany this article.

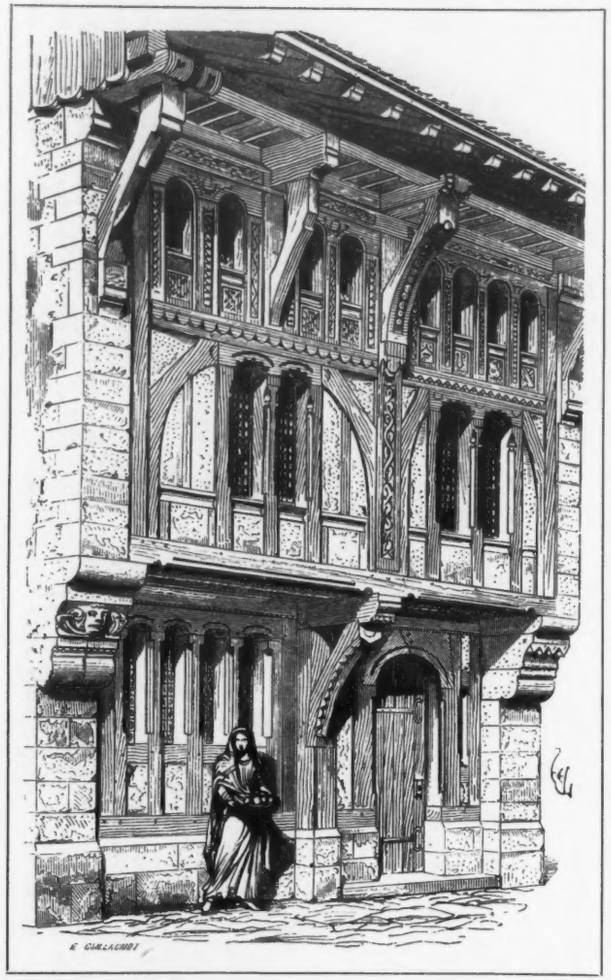


An illustration from Viollet-le-Duc's article on "Painting" during the Mediæval Period in France. Contrary to the usual opinion the Gothic builders painted considerable portions of the great churches and cathedrals upon both exterior and interior. From the "Dictionary of French Architecture," Vol. 7.

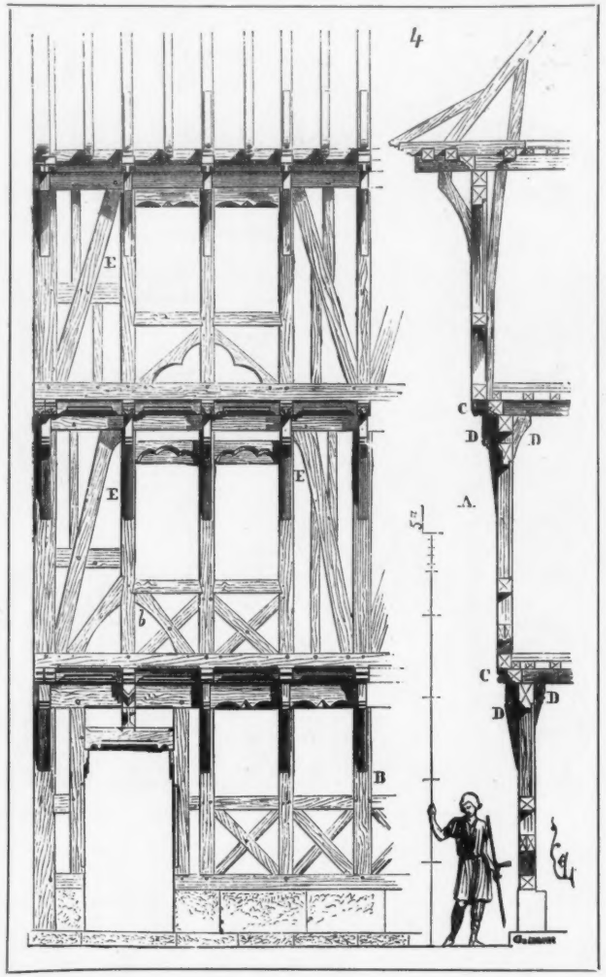
The *palace* is the first subject covered in this volume. The translation extends over twenty-eight pages in which every phase of the development of French castles or palaces of the period is discussed. The account as given forms an excellent background to the domestic architecture of France. Perhaps no country in Europe had a greater variety of palace architecture. The various types have been carefully studied by Viollet-le-Duc and are recorded here in a very instructive manner.

While palace architecture may be somewhat outside the realm of most modern architects, yet there are many phases of the smaller French domestic types that will offer direct inspiration for modern work, such, for instance, as French *half-timber work*. During the Middle Ages the use of half-timber construction was very common in France, and it reached a high state of perfection. This work is a combination of heavily framed wood sills, posts, braces, and ties, with the interstices filled in with masonry. This type of construction was particularly applicable to the narrow town-house, and at this period in French history the narrow streets of most of the cities were lined with houses and shops of half-timber work.

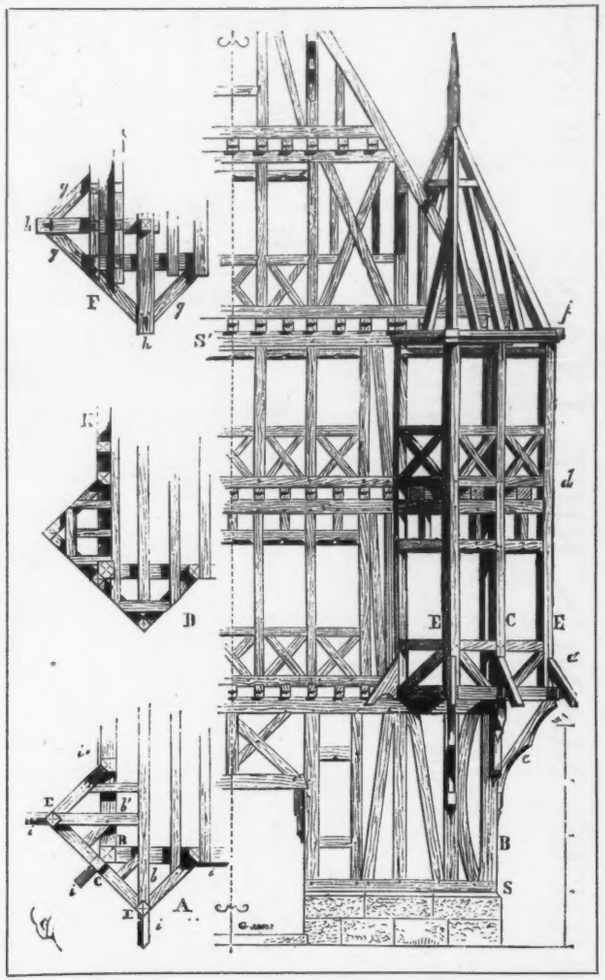
In the early half-timber work the heavy wood structural members were set only at right angles and the posts halved into sills and plates. End posts were rarely used in this early work, but the half-timber work was



An early French half-timber house showing how the framing was fitted in between the stone party walls which projected forward. The framing of this period was of large timbers.

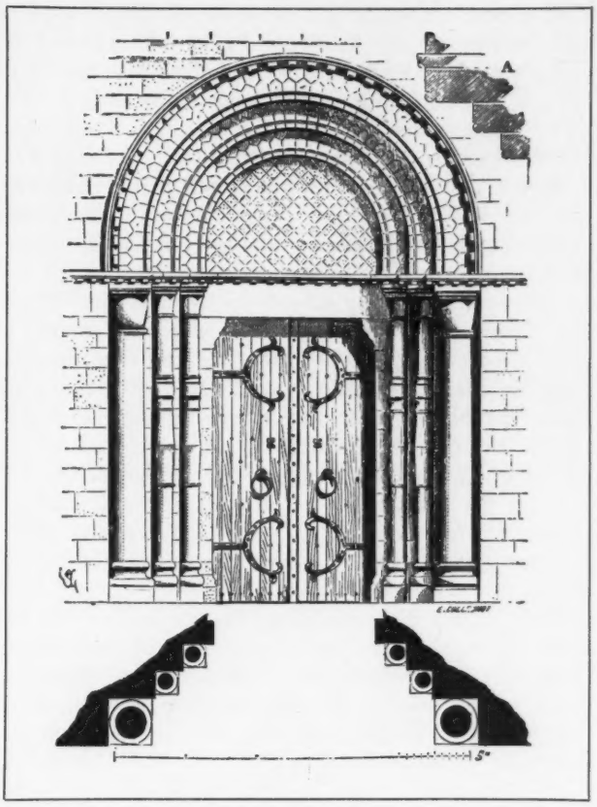


A later and more advanced type of half-timber work showing lighter members and also that the entire front was of framing, the ends of the party walls here being concealed.

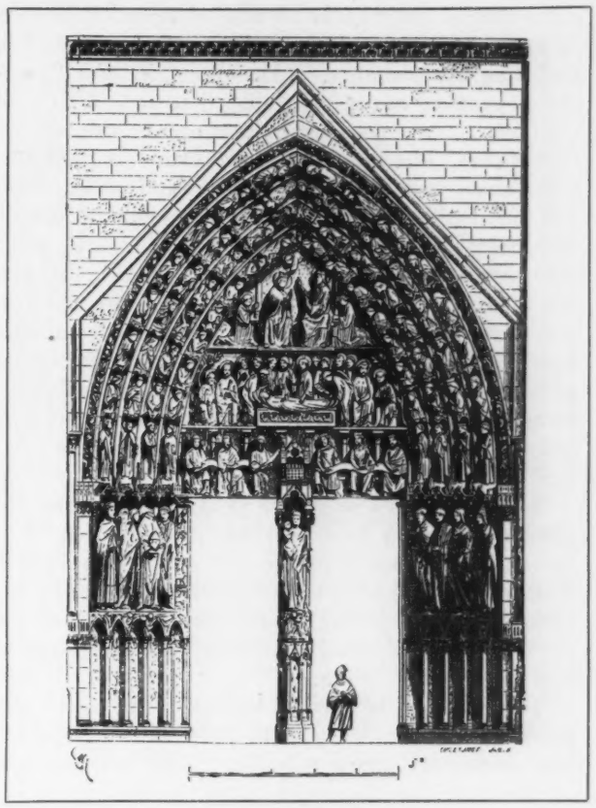


A still later development in French half-timber framing, made up of many small members. This period is also characterized by the use of a great variety of projecting bays and turrets at the corners.

ILLUSTRATIONS FROM VIOLLET-LE-DUC'S "DICTIONARY OF FRENCH ARCHITECTURE," VOLUME 7



A typical French Romanesque doorway, from Viollet-le-Duc's article on "Doorways," in his "Dictionary of French Architecture," Vol. 7.



A typical example of a fully developed Gothic doorway, from Viollet-le-Duc's "Dictionary of French Architecture," Vol. 7.

set between the two projecting ends of the masonry side walls. A well developed example of this type is that of an old house at Dreux, shown restored here. A great amount of labor was evidently expended upon the construction of this framework, for it was all of heavy timbers and very carefully joined. Joints of many different types were used, indicating that even at this early period half-timber framing was a highly developed art.

By the end of the XII Century lighter and more economical methods of framing are to be found. The end walls and gables of stone are all replaced by half-timber. The upper stories are often corbelled out. Details showing the method of framing are given here. In a three-story house the corner posts were usually eight or nine inches square; intermediate posts six or seven inches square; floor beams were placed about three feet on centers and these carried the lighter framing of the floor. Swaying of the frame was prevented by strong corner braces and X braces below the window sills.

Viollet-le-Duc was perhaps the best authority of his time concerning the use of color on the architectural monuments of the Middle Ages. Consequently his extended discourse, in this volume, on painting and its relation to architecture is one of special interest to the architect. From the time of the Renaissance on down to the present, color in architecture has been increasingly neglected, even to the point where it was questioned whether the architects of the Mediæval Period ever used color to any extent on their structures, but in recent years the subject has been more completely revived. Viollet-le-Duc's study has been quite extensive and his discussion of painting is well worth studying. The translation covers more than fifty pages, and the original contains twenty-one illustrations. Unfortunately, however, these are not in color, but are diagrammatic showing how the color areas were divided.

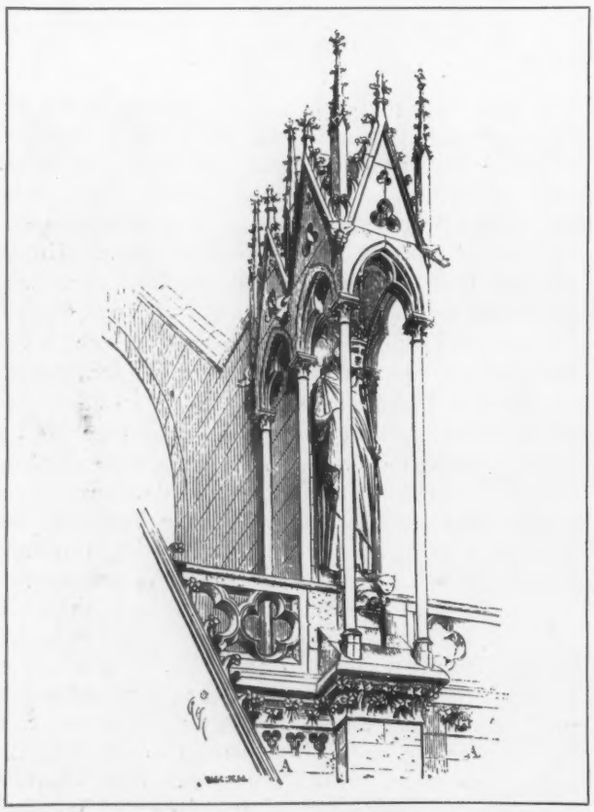
Viollet-le-Duc traces the early influence which brought to France the art of painting her architecture. He cites the Gallo-Roman and Italian traditions and the Grecian-Byzantine influences. The latter he believes exerted a most potent influence in favor of color. "It is not doubtful that this art was developed in the cloisters and proceeded from Grecian-Byzantine art. At that time the most beautiful fabrics, furniture, colored utensils, even a great number of manuscripts, brought from the Orient were contained in the treasuries and libraries of monasteries, and served as models for the monks devoted to art work." The art of painting seems to have been practiced very extensively in France during the Middle Ages and it was considered a part of architecture—the two arts mutually aiding each other. Old accounts state that "churches and cathedrals were painted and decorated in splendor." It is recorded that when Bishop Hincman was rebuilding the cathedral of Rheims he "ornamented the vaults by paintings." Viollet-le-Duc found evidence also that the architects of this period, like the ancients, also painted the sculpture of the interior and

often that of the exterior of their edifices. Wherever an interior was painted, the "entire surface was painted, including the sculpture." He also states that "decorative painting is not only applied to the surfaces of interiors, but it plays an important part on the exterior of edifices. The façade of Notre Dame of Paris presents numerous traces of painting and gliding, not laid on the bare walls, but on mouldings, columns, ornamental sculptures, and statuary. One can make the same observation on the cathedral of Amiens." He then describes in detail the various parts colored, the colors used, their intensity, methods of outlining figures, gilding, etc., and cites many examples. Altogether, the article on painting is a most valuable one, being the result of many years of research by one who had the opportunity of carefully examining the original structures.

Those interested in church design will find the discussion of *piers*, by Viollet-le-Duc, to be of value. The use and development of the pier systems, in French Romanesque and Gothic architecture, is carefully examined in every phase, the true function shown, and the proper architectural expression indicated in drawings.

The *pinnacle* is another of the architectural elements of the French Gothic of the Middle Ages which was developed because it had a specific use, and was not a mere ornament as it so often becomes in modern adaptations of the Gothic. "Like all architectural members of that time, pinnacles fulfil a function; they secure the stability of vertical supports by their weight. The brilliant epoch of the pinnacle came when architects began to erect flying buttresses." It being necessary to add a load at the upper part of the buttresses, the French builders made it a "beautiful necessity," consequently the pinnacles became a logical decorative feature, growing out of construction.

Another interesting subject discussed at some length by Viollet-le-Duc is that of the *pont*—or bridge—of the Middle Ages. It is a valuable and inspiring subject, in that it reminds us of a phase of architecture that has been almost lost to the modern architect. From the time of the Romans on down through the Middle Ages and the Renaissance, bridge design was within the domain of the architect, but in the past century it fell increasingly to the engineer, and utility, economy, and speed of construction were paramount, while the æsthetic qualities were often entirely neglected. Only in recent years has the architect in this country regained his place in this field of architectural endeavor. Viollet-le-Duc's discourse on bridges is well worth reading just for the inspiration it offers architects, especially those who are interested in this phase of architectural design.



An example of a very elaborate pinnacle of the French Gothic period, also illustrating how the French beautified necessary structural members, from Viollet-le-Duc's "Dictionary of French Architecture," Vol. 7.

The full-blown cathedral porch of the Gothic period, showing how the French beautified a common necessity. From Viollet-le-Duc's article on the "Porch" in his "Dictionary of French Architecture," Vol. 7.

THE ART OF CONCRETE FLOORING

By Wyatt Brummitt

IT'S A LITTLE difficult to discover exactly how the concrete floor was domesticated. One man's guess is about as good as another's. My personal belief is that the notion of using concrete indoors first occurred to a long-suffering husband during his wife's vacation absence.

Consider his plight. The dishes left from a week's hasty breakfasts and midnight snatches were piled in a disconcerting heap in the kitchen sink. The poor gentleman's better nature (he was probably an architect and therefore may be assumed to have had a better nature) urged him to clean up the mess, but the prospect was a dismal one.

"If only," he mused, "I could dump those dishes on the floor, there in the corner, and turn the hose on 'em, I could clean up the whole smear in no time . . . By Jove, if this floor were concrete, with a drain in it, it'd be a cinch!"

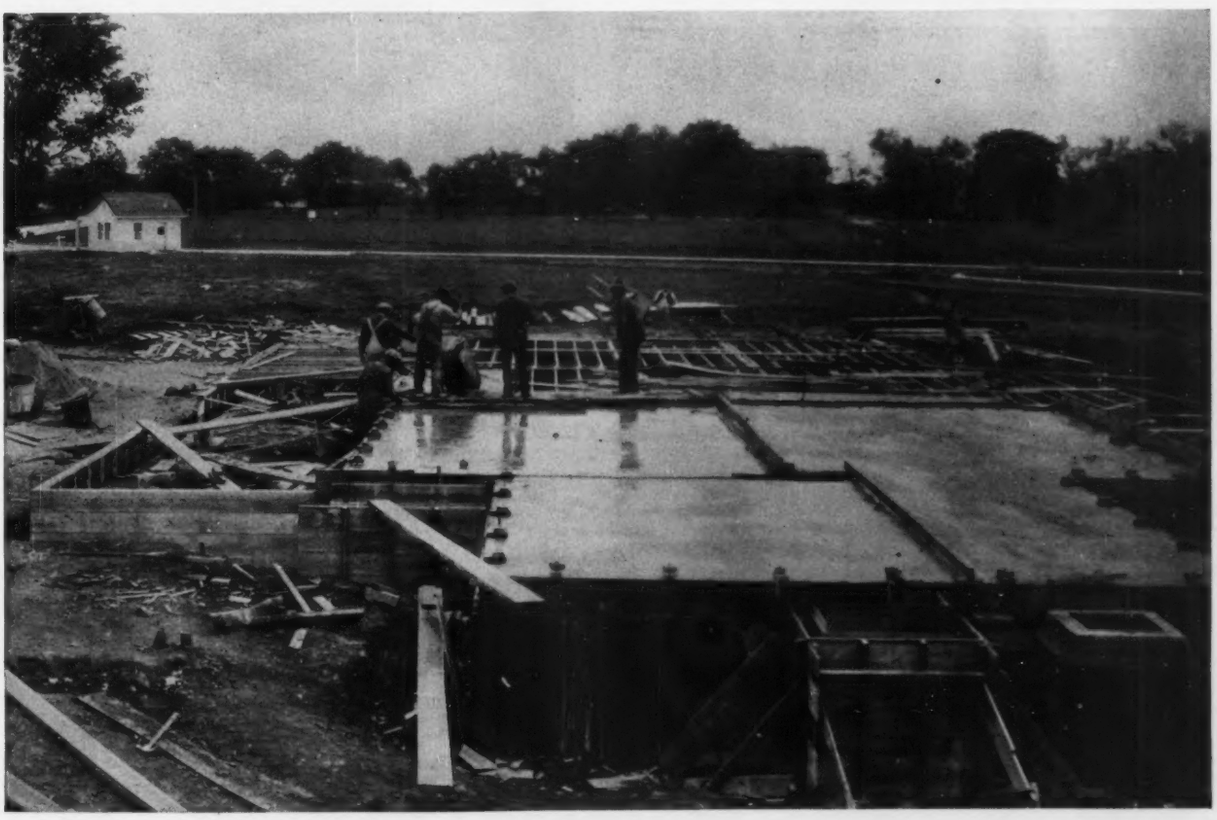
Thus, out of dire adversity, came the idea of domesticated concrete. At any rate, that's my story.

Whatever its origin, the concrete floor is now as much at home in the residences and mansions of our better people as it is in hotels, office buildings, hospitals and garages. Of course, it has changed somewhat in the process of domestication; it has acquired new manners, an air of sophistication and a thoroughly modern kind of beauty. But it is still concrete, which is to say that it is still structurally self-supporting, plus, and unhospitable to fire, to rodents, to termites, and to various other enemies of domestic felicity, including swift depreciation. And if one really wants to hose the dishes on it, go right ahead.

Structurally, the concrete floor is a simple matter of engineering. It may be built in several different manners, depending on its span, the weight to be carried and other circumstances. Architecturally, the situation is more complex; for a concrete floor is, to the canny architect, what a fresh canvas is to the painter. He can do just about anything with it, within the range of his genius for *decor* and his knowledge of concrete.

He can impose his finish directly on the structural slab, staining and polishing it to achieve his desires. Or he can place a separate layer or layers of top-coat concrete over the slab and incorporate in the finish coat color, pattern, texture or whatever appeals to his sense of desirable decoration. Finally, if he wishes to combine the advantages of a concrete floor with the qualities of a more conventional finish, he can do so easily, superimposing wood, tile or linoleum over the concrete.

This word of warning should be spoken:—under



Casting the concrete floor for a residence. Foundation and floor are formed into a solid monolith by this method, considerably increasing the stability of the entire structure.

Wooden nailing strips, embedded in the concrete while plastic, afford a stable base for conventional floors of hard wood.

no circumstances should a concrete floor be laid by inexpert workmen. Concrete is disarming in its seeming simplicity, so disarming that it often suffers at the hands of men who take it for granted that, being simple, concrete is also foolproof. In no work is it more important that the rules of modern concrete technique be observed than in the building of a concrete floor finish. For a floor is the most used part of any home, subjected to wear and tear, to frequent and often drastic cleanings and to the abrasive action of walking, tripping or dancing feet—depending on the time of day and what the radio plays.

Concrete for a floor finish should be mixed with full consideration of the water-cement ratio law; it should not be steel-trowelled immediately after it has been screeded to a level, for such trowelling brings an excess of fines to the top and produces all the conditions for dusting, scaling and other unpleasantnesses. Trowelling should be postponed until the concrete has almost set; at that point the mass is fairly stiff and the steel trowel serves to smooth and compact the concrete without displacing its essential composition.

Ample time should be given the floor to cure; for curing is an important and frequently neglected part of the formula for producing durable concrete. If possible allot ten days to curing, keeping the floor moist and protected throughout the period.

A breakfast room provided with a simple but cheerful floor of concrete tile.

An unusual pattern in black and white concrete tile, laid over a structural concrete base.

Such technicalities are basic; no good concrete contractor ignores them, but it is well to keep them in mind in planning the decorative character of the floor, for its success depends on sound concreting.

Suppose it be assumed, for the purpose of this story, that a sound concrete floor has been laid, smoothly finished and cured. What can be done, decoratively speaking, with this hard, smooth surface?

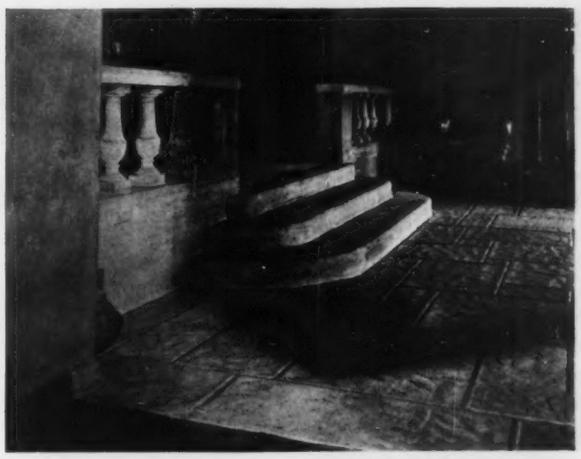
For one thing, it can be stained and polished, to produce a mottled, glossy and mellow effect. Inorganic stains are applied with a mop or brush and allowed to react on the concrete until the desired tone is achieved. Then, when the stain has thoroughly dried, it is treated with hardener and subsequently waxed and polished. Incidentally, do not attempt to stain a concrete floor which has been especially built

for heavy-duty; the stain simply won't be able to get a toe-hold.

Perhaps a more intense surface color is desired. Painting is one way to get it, but paint should not be applied to raw concrete, particularly new concrete, without certain preparations. The natural alkalinity of the concrete must be neutralized in order to create a proper affinity between the concrete and the paint. Neutralization is accomplished by mopping the surface with a solution of zinc sulphate. After the solution has dried, the floor should be brushed and then it is ready. Paints having pure linseed or china wood oils for vehicles are best, with abrasion-resisting pigments. Thin the first coat to help penetration; subsequent coats may be run-of-the-can.

So much for applied colors. Suppose integral coloring is desired. This becomes a matter of mixing mineral pigments with the concrete in the floor surface, in the inch or so of concrete which is bonded to the structural floor. The range of possible colors is practically complete, but satisfactory results depend on the observance of what is now a well established technique. In the first place, be sure that the pigments are mineral, or non-organic; for some organic colorings have a somewhat weakening effect on the concrete. Conversely, there are mineral pigments which tend actually to increase the strength of the concrete in which they are used; ultramarine blue, in certain proportions, works in this fashion.

Another thing about using pigments. It is best to have them mixed with the cement under factory control; job-mixing is less definite and may result in uneven coloration. The following table indicates approved means of obtaining various colors. It is assumed that the concrete mortar consists of approximately one part of cement to two parts of clean sand passing a one-eighth inch screen.



When something exceedingly picturesque is desired, a concrete floor finish in keeping with the most pronouncedly different kind of interior decoration can be achieved. Here the floor has been irregularly trowelled to simulate old slabs of stone, with deep grooves marked between the "slabs."

After a floor colored with integral pigment has been cured and cleaned, it may be waxed or polished exactly as a wooden floor.

Many architects have taken advantage of concrete's early plasticity to strike off geometric designs in it; if sharper lines are desired, a carborundum wheel will do the trick, working over the hardened surface.

Possibly the most popular form of concrete floor is

Color Desired	Commercial Names of Colors for Use in Cement	Pounds of color required for each bag of cement to secure	
		Light Shade	Medium Shade
Grays,	Germantown Lampblack* or	½	1
blue-black	Carbon Black* or Black	½	1
and black	Oxide of Manganese* or	1	2
	Mineral Black	1	2
Blue	Ultramarine blue	5	9
Brownish red to dull brick red	Red oxide of iron	5	9
Bright red to vermilion	Mineral turkey red	5	9
Red sand-stone to purplish red	Indian red	5	9
Brown to reddish brown	Metallic brown (oxide)	5	9
Buff, colonial tint and yellow	Yellow ochre or	5	9
	Yellow oxide	2	4
Green	Chromium oxide or	5	9
	Greenish blue ultramarine	6	

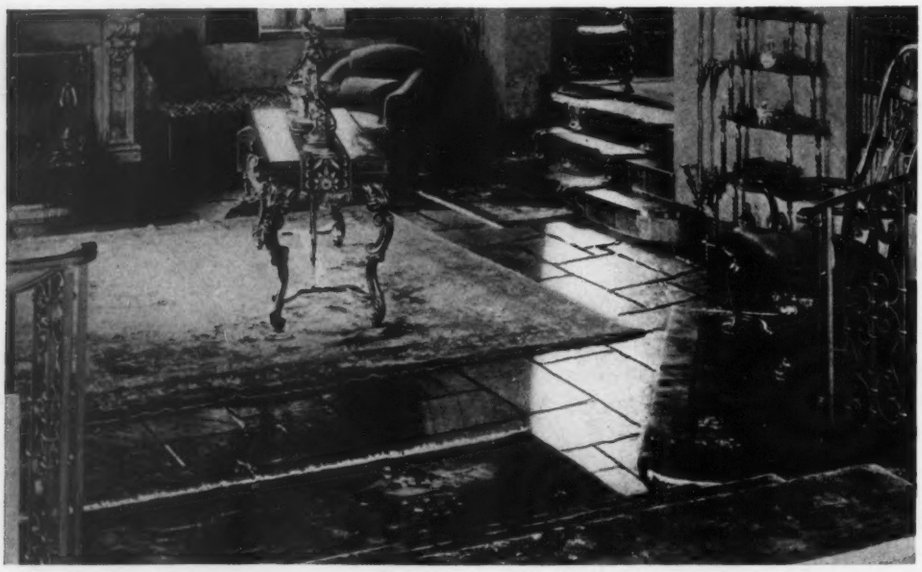
* Only first quality lampblack should be used. Carbon black is of light weight and requires very thorough mixing. Black oxide or mineral black is probably most advantageous for general use. For black use 11 pounds of oxide for each bag of cement.

terrazzo—a floor in which the wearing surface is composed largely of marble chips or any other desired aggregate. Terrazzo finish does not rest directly on the structural slab, but on an intermediate base of mortar which is often reinforced with expanded metal or wire mesh. One of the features of terrazzo, its subdivision into many units by the use of brass strips, has opened up a new field in floor design. The use of contrasting aggregates in neighboring sections was the beginning of the new decoration with terrazzo; close after followed a departure in the manner of spacing and placing the section strips. Today, anything from the most austere to the most rampantly "moderne" is possible with terrazzo. More that that, it is done, and with great gusto.

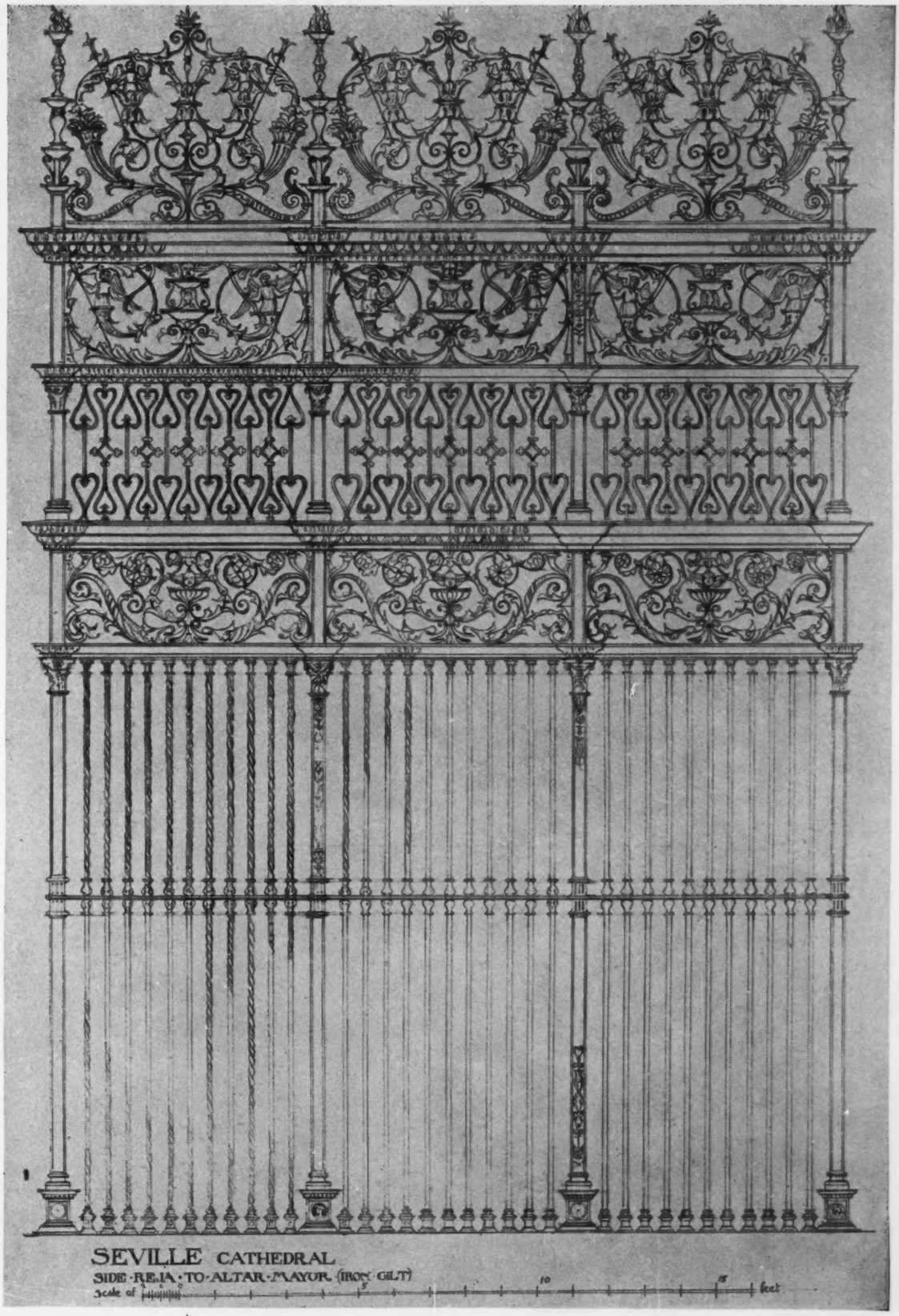
A concrete floor, stained and marked off geometrically.

Increased use means more varied use. Hence it is natural that, with the increasing use of concrete floors in residences, there should be a constantly widening variety of treatment. More and more concrete floors are being put into small and relatively inexpensive homes. The added cost is usually computed as less than two per cent. of the cost of a house with an ordinary first floor. Considering the added firesafety, strength and beauty, the expenditure is a fairly high class investment.

When the concrete floor began the domestication process there were wails from some who foresaw cold, clammy and uncomfortable years ahead for their feet. But they forgot that there would be warmth and dryness above and below the concrete, with the result that the concrete itself would be both warm and dry. And they knew nothing about concrete's capacity to become friendly, in a mellowly colorful way.



Sunlight—on old stone, worn smooth by centuries of passing of bare feet—the impression given by this irregular slate floor in the residence of Mrs. R. B. Brown, St. Cloud, Minnesota.



RENAISSANCE ARCHITECTURE AND ORNAMENT IN SPAIN

A PLATE FROM THE WORK BY ANDREW N. PRENTICE

PENCIL POINTS FOR NOVEMBER, 1930
VOLUME XI NUMBER 11

"Before the fall of the choir, the screens in Seville Cathedral were the most splendid in Spain, both in size and magnificence. The example given is one of the lateral screens to the Capilla Mayor, wrought by Sancho Muñoz in 1518, and although not so high and elaborate as that facing the high altar, it is of great beauty. The twisted pillars are of solid iron, and the cornices are formed of hammered iron plates. This screen is entirely gilded from top to bottom."

A. N. PRENTICE.

RESIDENCE AT BEVERLY HILLS, CALIFORNIA—KOERNER AND GAGE, ARCHITECTS

FROM A RENDERING IN TRANSPARENT AND OPAQUE COLOR BY ROBERT LOCKWOOD

PENCIL POINTS
(November, 1930)

PENCIL POINTS SERIES
of
COLOR PLATES

At the time this drawing was made, Mr. Lockwood was experimenting with washes, using body color (no transparent color) thinly, like water, laying wash over wash, building up tones. The perspective layout was first outlined in ink, freehand, on brown cardboard. Color was applied to all parts of the drawing at once, establishing a general "key." Then, after working a bit on the foliage, windows, etc., a heavy wash of burnt sienna with a little blue in it was run down over the entire assemblage of body color which settled it in this case in a rather pleasing way. Doing this with thin body color over heavy is a delicate stunt because the heavy color sometimes lifts, but when successful it gives a good effect. It is necessary to use a very full puddle and work quickly "with extreme care and considerable recklessness" to quote the artist. As a finishing touch the building, roof, and bits of the foliage were painted up with heavy color. The sky was given a final coat of cobalt, mauve, and black. The original measured 24½" x 13".

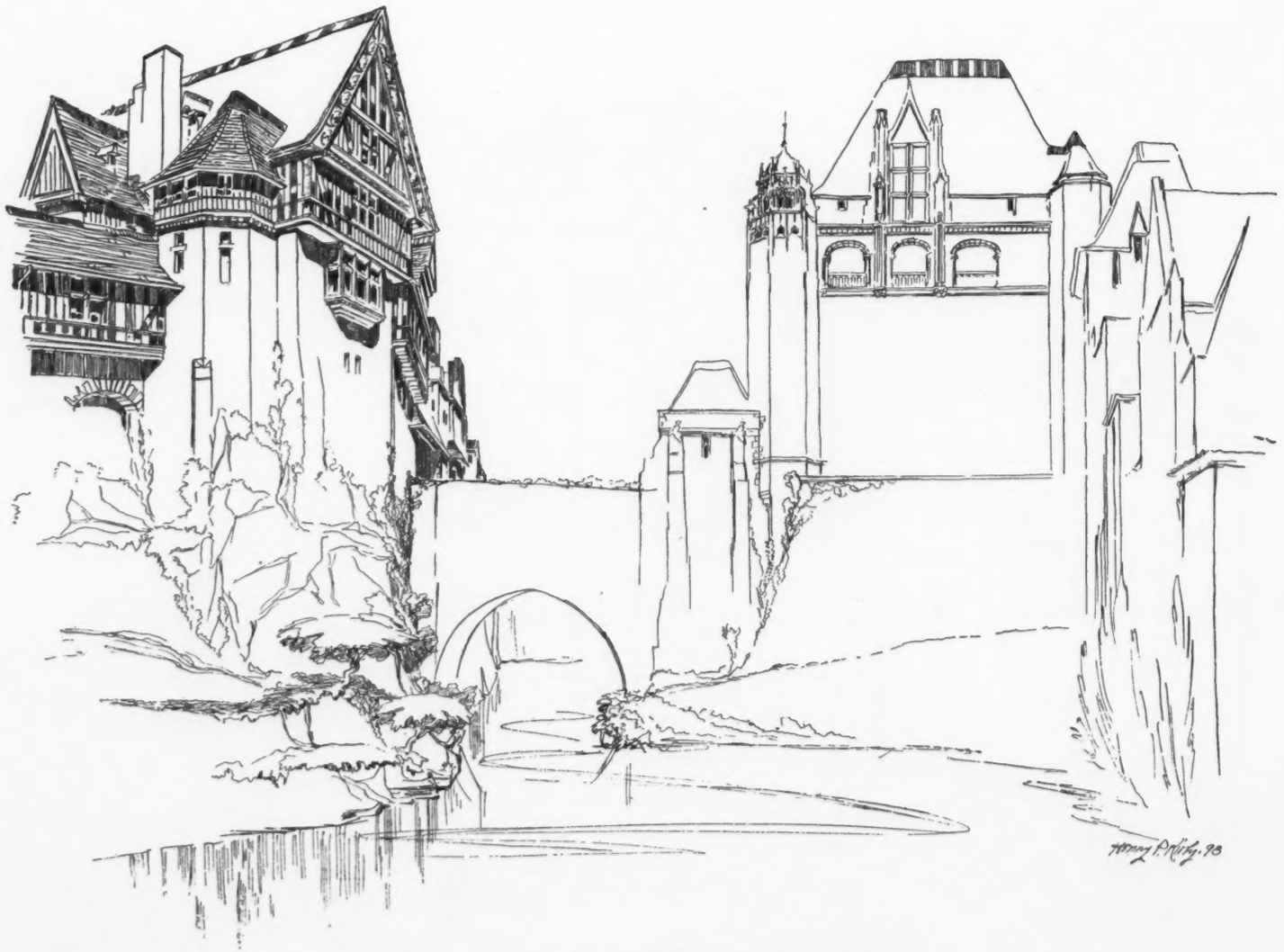
NEW GREENBRIER HOTEL, WHITE SULPHUR SPRINGS, WEST VIRGINIA—PHILIP L. SMALL, INC., ARCHITECTS

FROM A RENDERING IN WATER COLOR

PENCIL POINTS
(November, 1930)

PENCIL POINTS SERIES
of
COLOR PLATES

This rendering was made by a well known draftsman who, for good reasons of his own, wishes to remain anonymous. It was very large, the original measuring about 72″ wide. It is reproduced as a suggestion of a way for presenting large schemes where the horizontal lines of the architecture may be advantageously broken up by the foreground trees. In this particular case the natural setting for the buildings lent itself quite well to this type of composition.

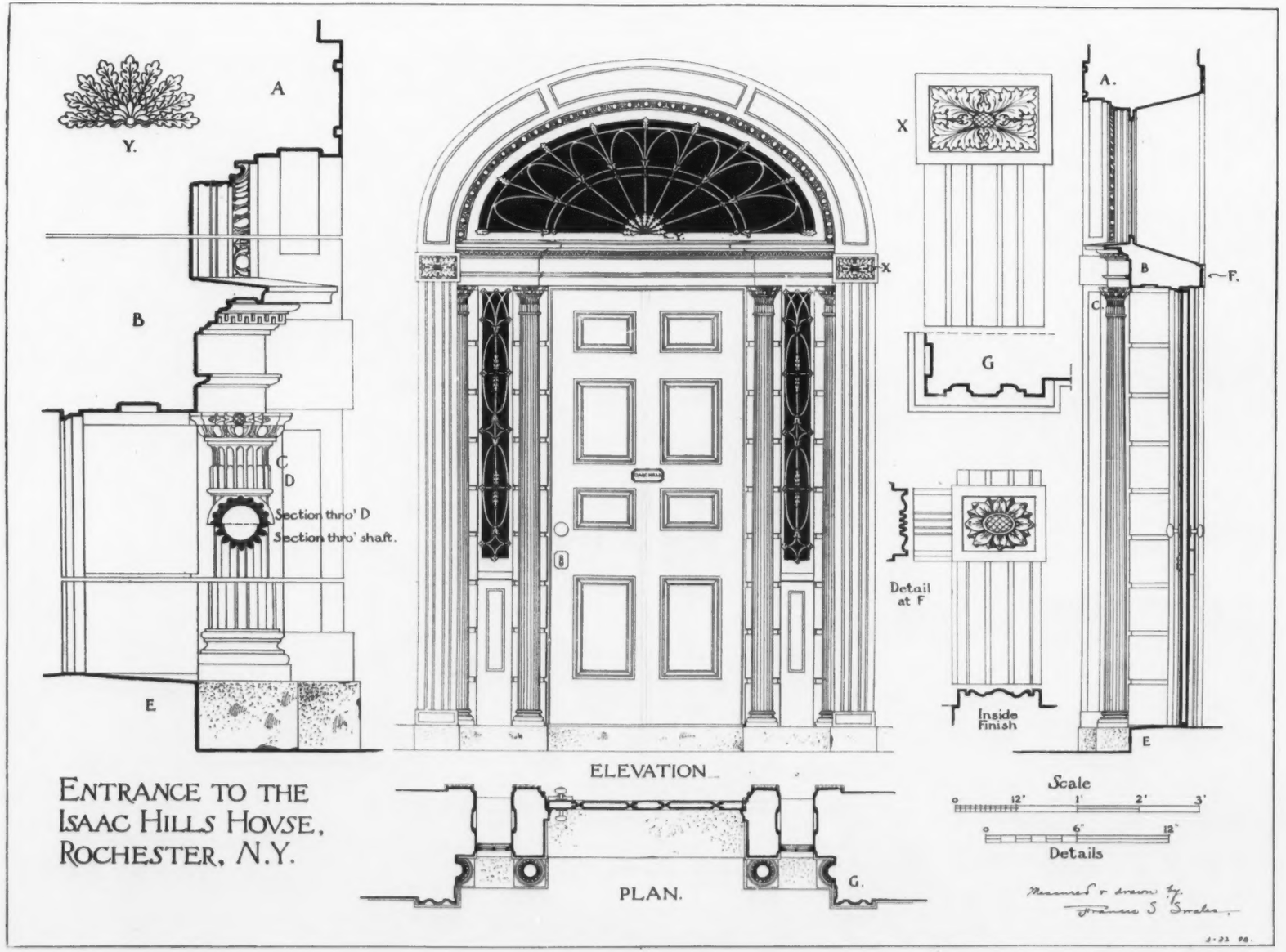


FROM A PEN AND INK DRAWING BY HENRY P. KIRBY

A COMPOSITION IN ARCHITECTURAL FORMS

PENCIL POINTS FOR NOVEMBER, 1930
VOLUME XI NUMBER 11

This sensitive pen and ink drawing by Henry P. Kirby was originally published by the Cutler Manufacturing Company as part of a series of plates prepared for them for architects. This particular reproduction was made from one of the plates in possession of Arthur M. Duncan of New York through whose courtesy we are able to present it here.



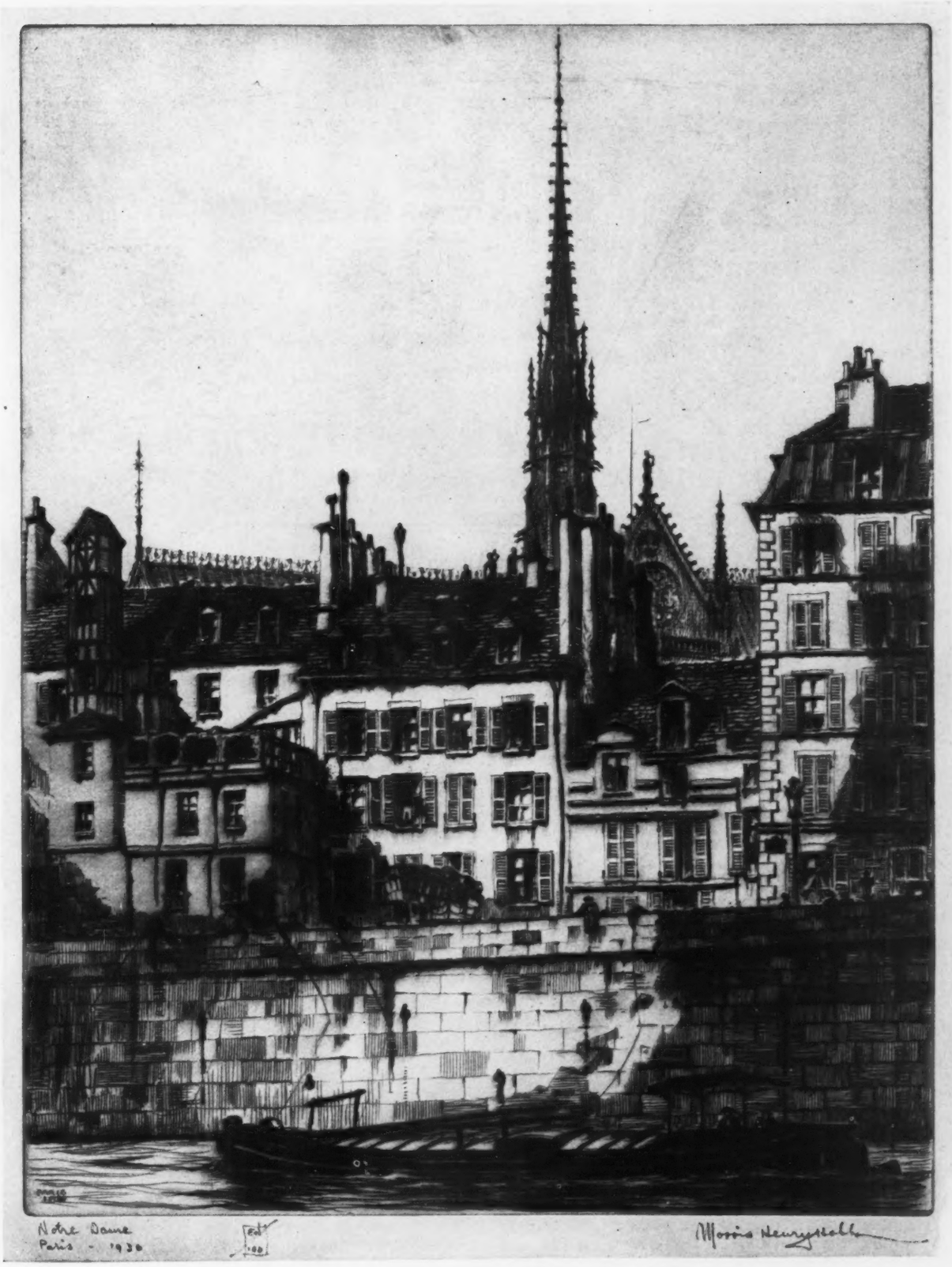
ENTRANCE TO THE ISAAC HILLS HOUSE, ROCHESTER, N.Y.

FROM A MEASURED DRAWING BY FRANCIS S. SWALES

ENTRANCE TO THE ISAAC HILLS HOUSE, ROCHESTER, NEW YORK

PENCIL POINTS FOR NOVEMBER, 1930
VOLUME XI NUMBER 11

This drawing was made for Ware's "The Georgian Period" in 1898. Aside from being a bit of fine draftsmanship it preserves a record of a graceful example of Colonial doorway and its publication here is therefore doubly useful.



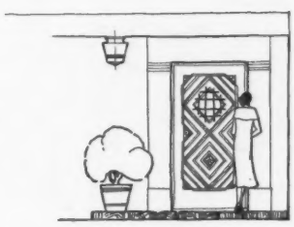
FROM A DRYPOINT BY MORRIS HENRY HOBBS
"NOTRE DAME, PARIS"

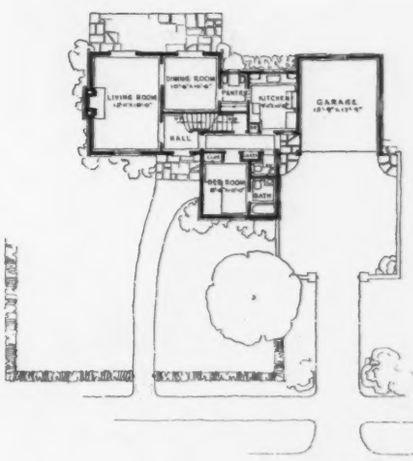
PENCIL POINTS FOR NOVEMBER, 1930
VOLUME XI NUMBER 11

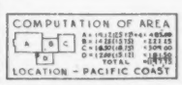
On this plate we have reproduced a drypoint by Morris Henry Hobbs, an Evanston, Illinois, architect who, in his spare time, turns out excellent prints such as this one. The original, which measures 7" x 9", is quite professional in quality.

DESIGN FOR AN EIGHT-ROOM HOUSE

THE PENCIL POINTS COMPETITON





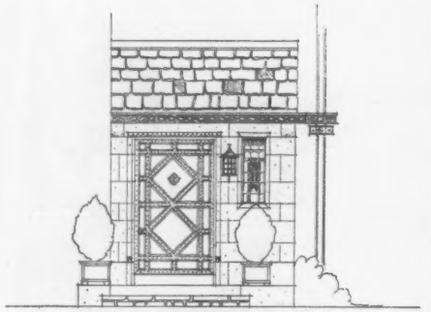


SUBMITTED BY GALEN W. BENTLEY, NEW YORK

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE

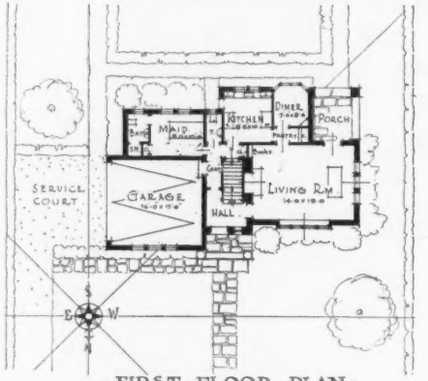
- SIDE-ELEVATION -

- PERSPECTIVE -
SCALE

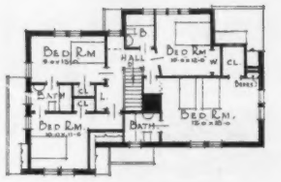


- DETAIL-OF-ENTRANCE -
SCALE

- REAR-ELEVATION -



- FIRST-FLOOR-PLAN -



- SECOND-FLOOR-PLAN -

- MULTEM - ET - PARVO -

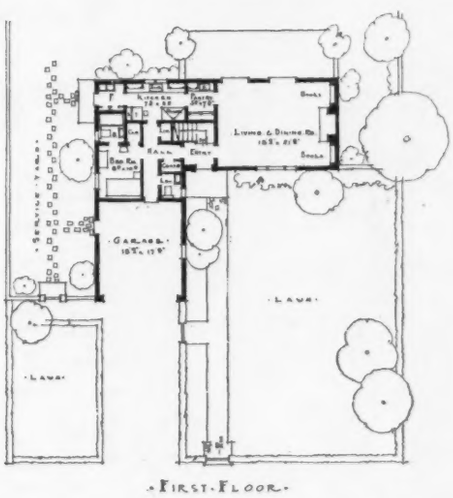
- DESIGN-FOR-AN-EIGHT-ROOM-HOUSE -

- THE - PENCIL - POINTS - COMPETITION -

AREA OF HOUSE 877
" " GARAGE 323
TOTAL 1200 FT.
TO BE BUILT IN THE NEW ENGLAND STATES

SUBMITTED BY WILLIAM C. BUNCE, DETROIT, MICHIGAN

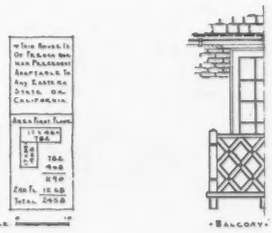
PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE

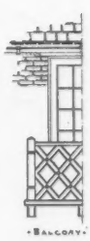


FIRST FLOOR

SECOND FLOOR

SOUTH ELEVATION





BALCONY

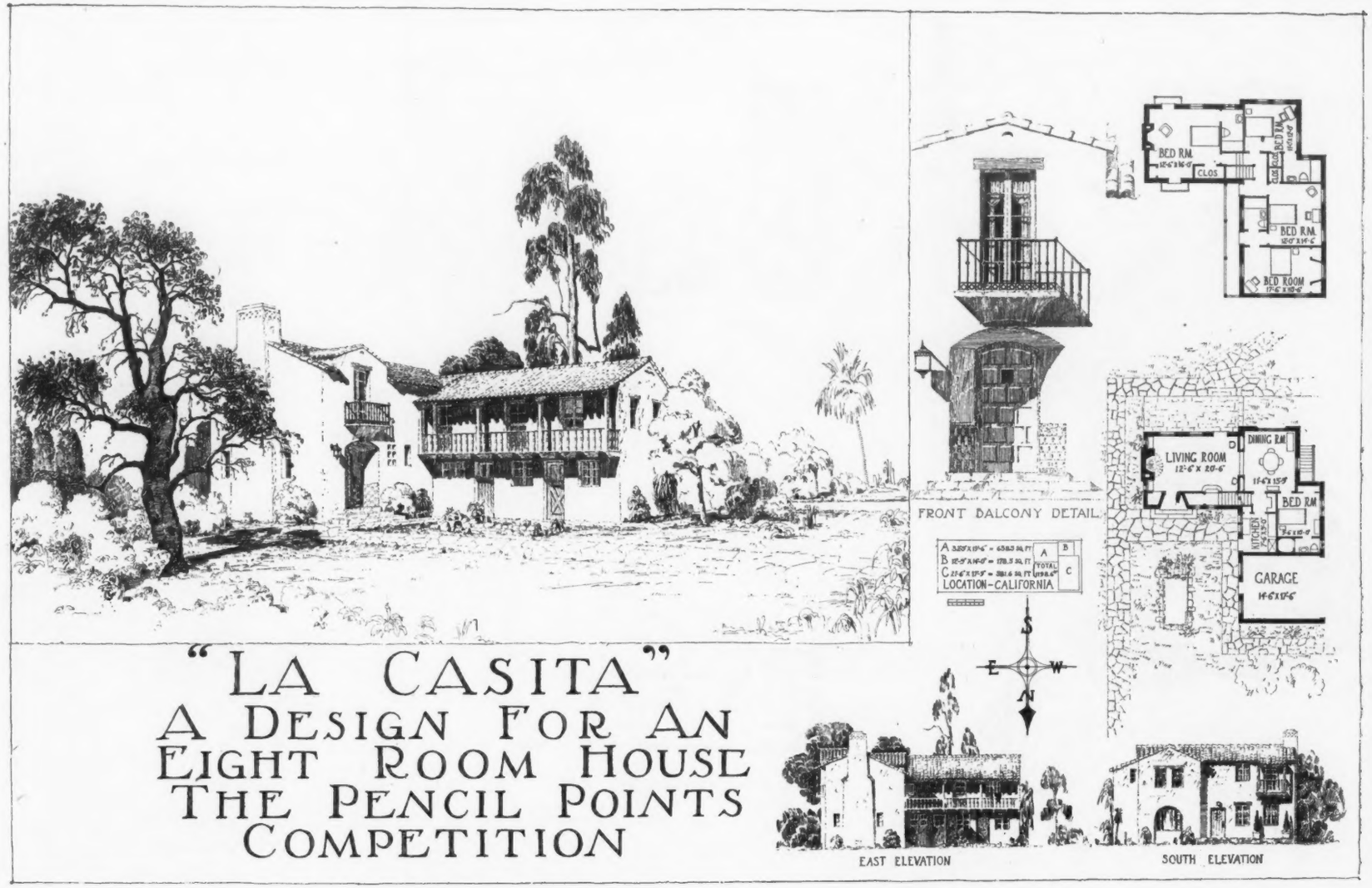
EAST ELEVATION

SUBMITTED BY

DESIGN FOR AN EIGHT ROOM HOUSE — THE PENCIL POINTS COMPETITION

SUBMITTED BY CHARLES H. HOLMSTROM, STATE COLLEGE, PENNSYLVANIA

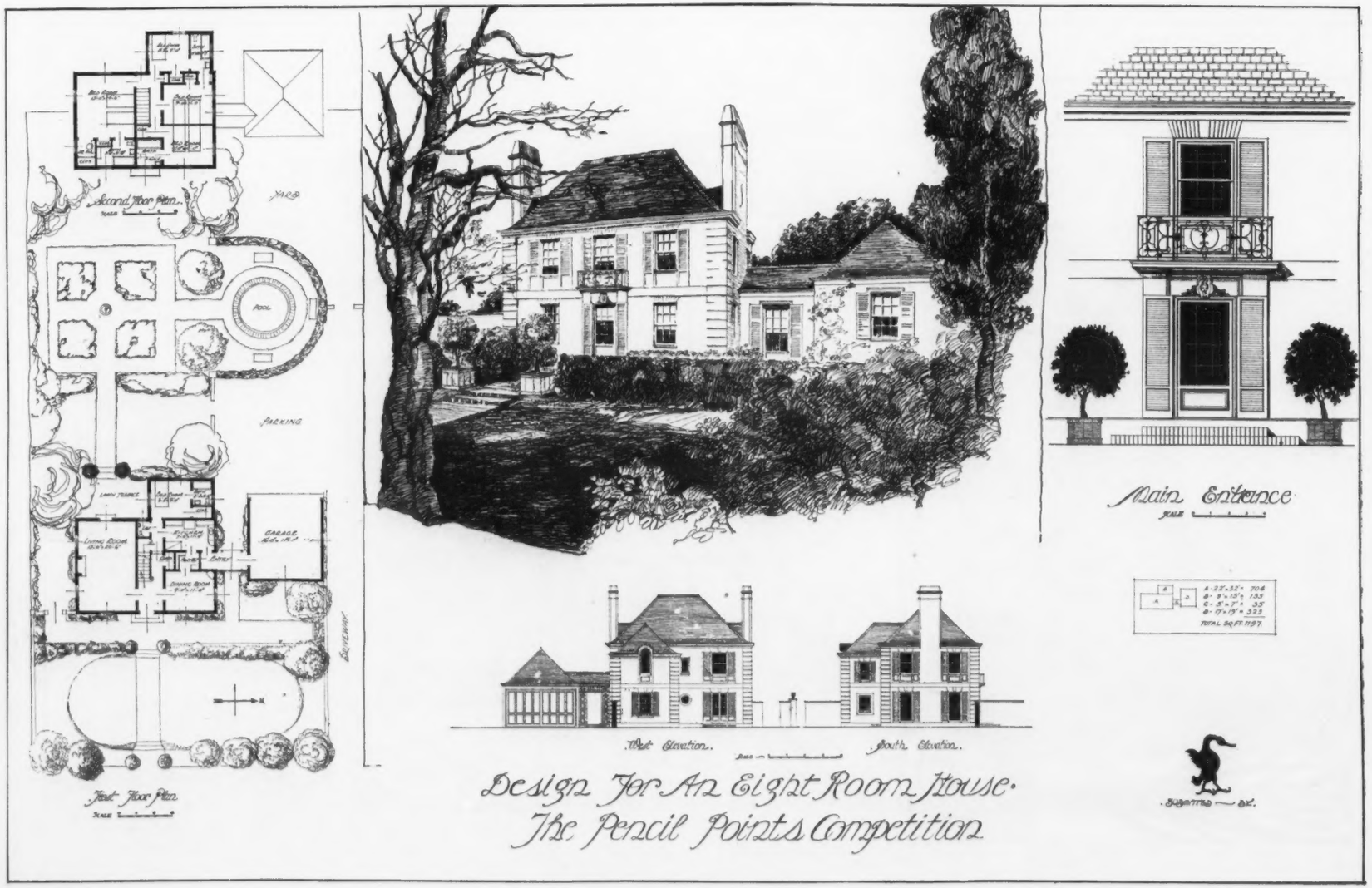
PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE



"LA CASITA"
A DESIGN FOR AN EIGHT ROOM HOUSE THE PENCIL POINTS COMPETITION

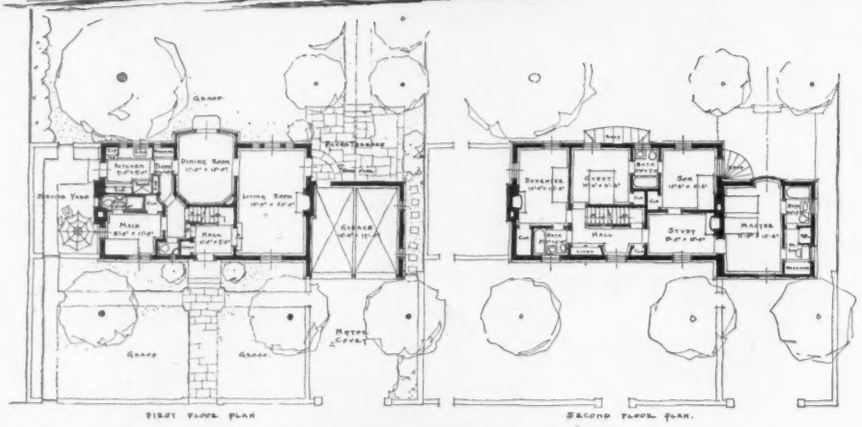
SUBMITTED BY CLARENCE H. RAWLINGS, PHILADELPHIA, PENNSYLVANIA

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE

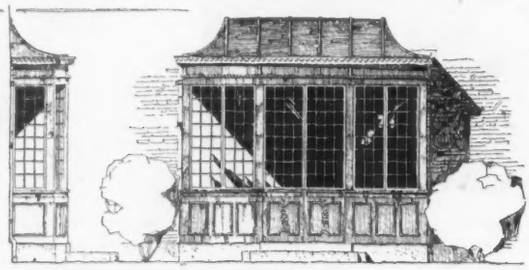


SUBMITTED BY JAMES GABRIEL RESH, NEW YORK

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE



DESIGN
FOR AN
EIGHT ROOM
HOUSE



—MATERIALS—

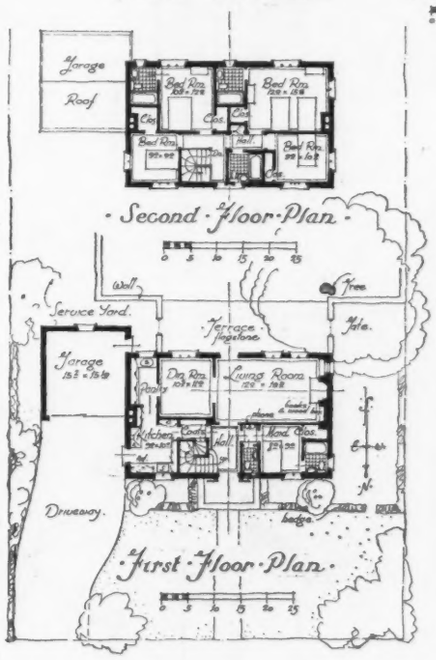
WALLS IN GENERAL ARE TENDED OF ROUGH BRICK, WITH SOLID BRICK WALLS TO GARAGE, TILE ROOFING, COPPER, GARAGE ROOFS, AND LEAD-COVERED BAY TO THE DINING ROOM. THE BODY IS SHINGLE TILE.

~ THE PENCIL POINTS COMPETITION ~

SUBMITTED BY FRANKLIN SCOTT, WHITE PLAINS, NEW YORK

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE

North Elevation · East Elevation · South Elevation



Second Floor Plan

First Floor Plan

Entrance Detail

Submitted by
Pen Points

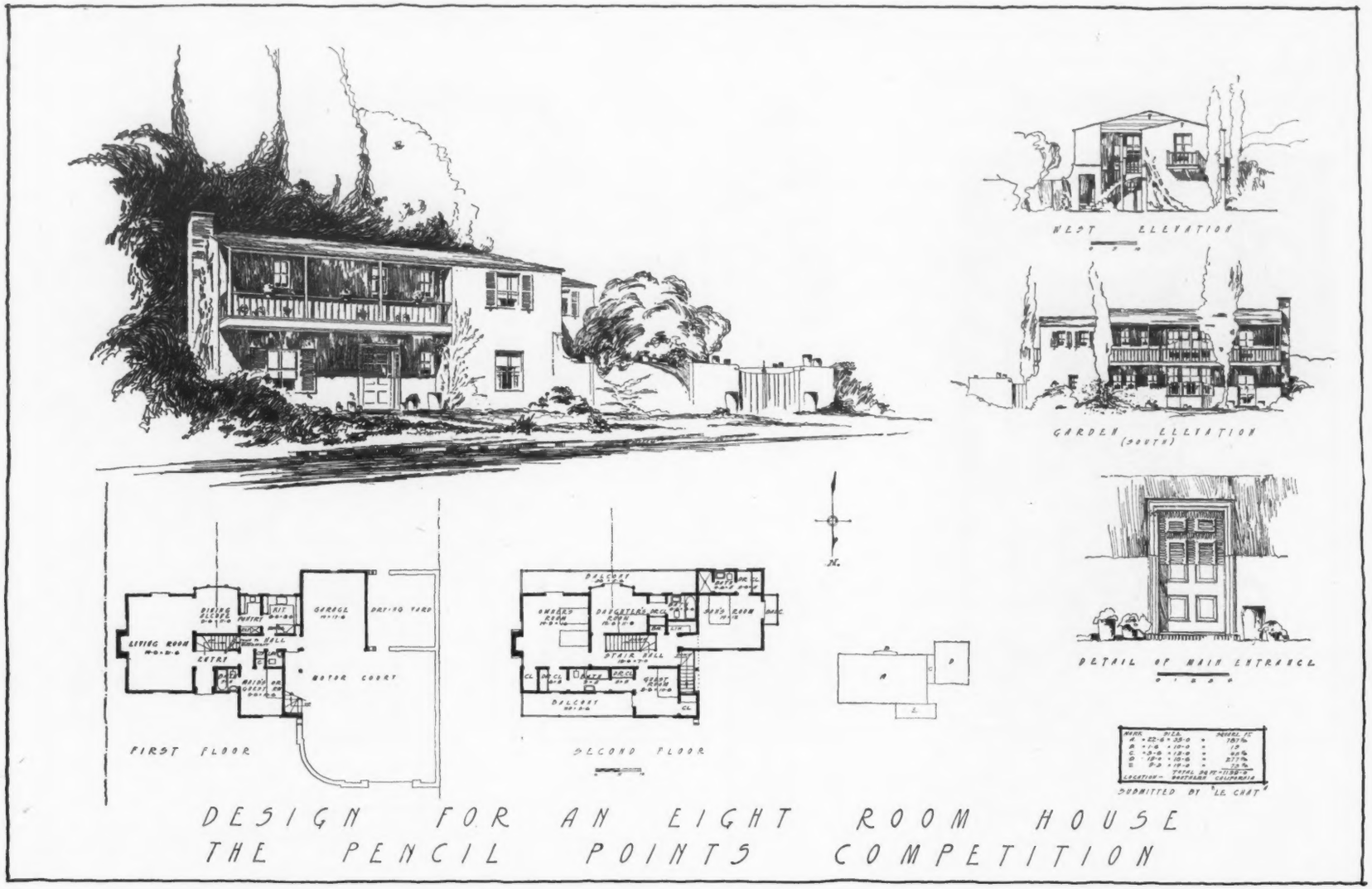
Area
Main House 26'4" x 36'6" = 968
Garage Part 14'0" x 17'6" = 220
Total 1188 sq ft

Location
Central or Eastern States

Design For An Eight-Room House
The Pencil Points Competition

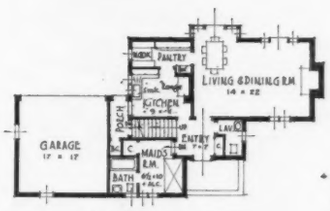
SUBMITTED BY C. RODERICK SPENCER AND JOHN JAMES LANDON, LOS ANGELES, CALIFORNIA

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE



SUBMITTED BY CLIFFORD TRUESDELL, JR., AND NORMAN THOMPSON, LOS ANGELES, CALIFORNIA

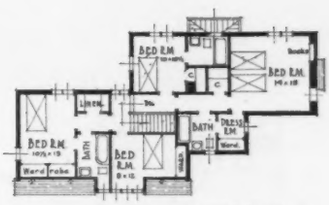
PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE



FIRST FLOOR PLAN

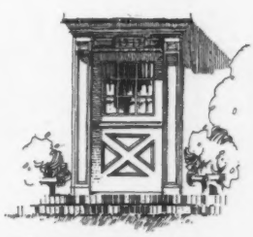
SUBMITTED BY

GRAPHIC SCALES
PLANS
DETAIL
PLOT

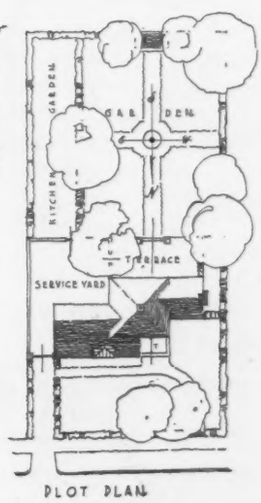


SECOND FLOOR PLAN

WEST ELEVATION



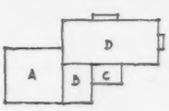
½ INCH SCALE DETAIL



PLOT PLAN

SOUTH ELEVATION

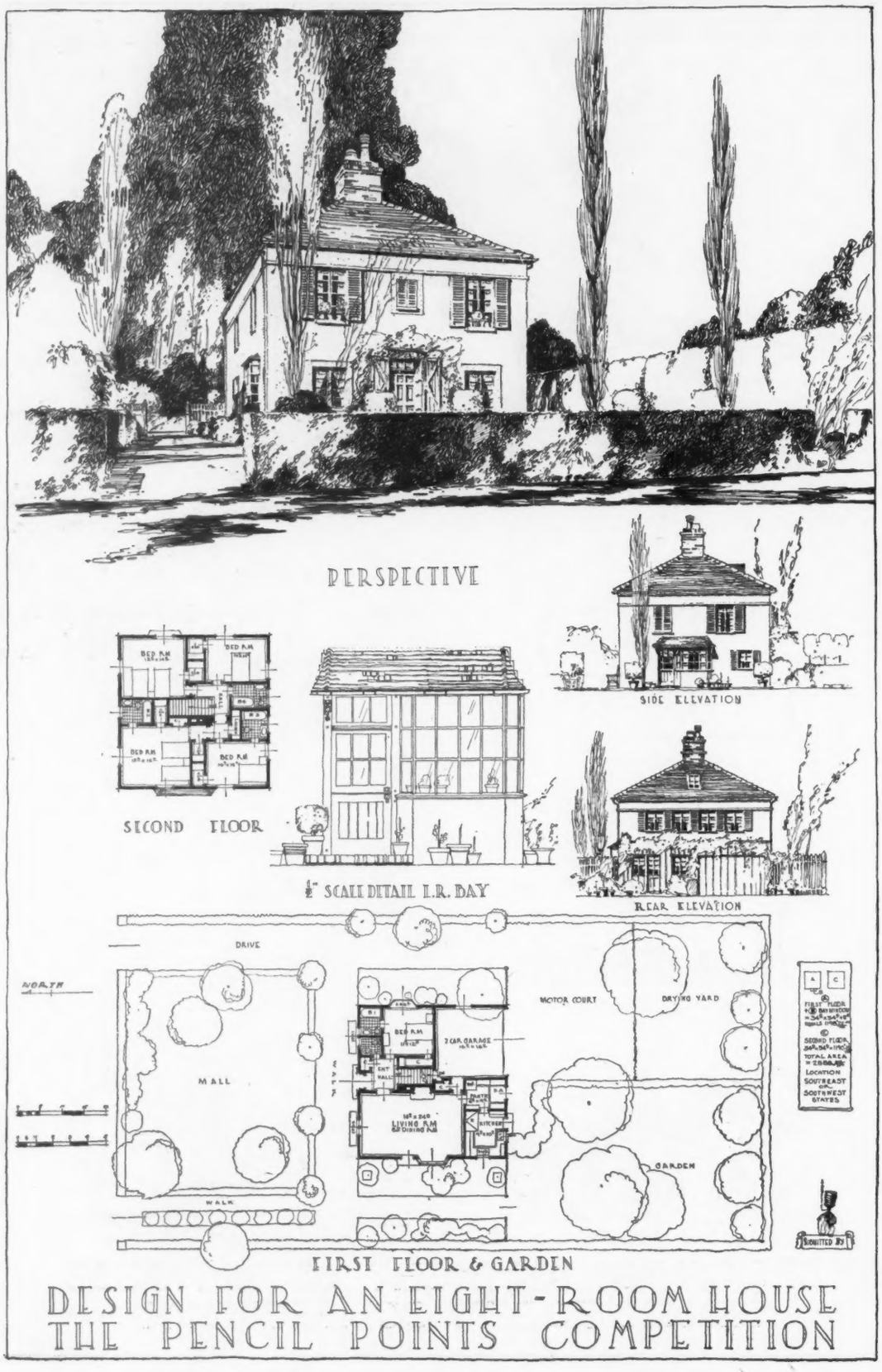
SQUARE FOOTAGE
A = 19×21 = 399 D = 15% + 35 = 542%
B = 11×14 = 154 FIREPL + BAY = 27%
C = 7×11 = 77 TOTAL = 1200
GEOG. LOCATION — SO. CALIF.



DESIGN FOR AN EIGHT ROOM HOUSE
PENCIL POINTS COMPETITION

SUBMITTED BY LLOYD STEFFGEN, PASADENA, CALIFORNIA

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE



SUBMITTED BY LYLE REYNOLDS WHEELER, HOLLYWOOD, CALIFORNIA

PENCIL POINTS COMPETITION FOR AN EIGHT-ROOM HOUSE

COMPETITION FOR THE GUY LOWELL MEMORIAL SCHOLARSHIP

THIS SCHOLARSHIP IS given in memory of Guy Lowell, 1870-1927, a distinguished architect, who believed in the importance of foreign study and travel, and who was a generous and sympathetic friend of all students.

The value of this scholarship is represented by an annual award of $1,000 to assist draftsmen, and students in schools of architecture whose previous preparation includes three years of office training, to benefit by six months' travel in foreign countries.

The competition is open to citizens of the United States of good character, who are between twenty-one and thirty-one years of age, and who have had at least three years of office experience.

The competition will be held the first Saturday and Sunday in February, 1931.

The scholarship is under the direction of a managing committee of three, composed of the Chairman of the Committee on Education of the Beaux-Arts Institute of Design, the Head of the Department of Architecture at the Massachusetts Institute of Technology, and a practicing architect in Boston.

Competitors are allowed to prepare their drawings wherever conditions conform to the requirements of the committee in charge, but these drawings must be sent to Boston for judgment.

All questions and applications should be addressed to and application blanks returned to Mr. H. P. Richmond, 12 West Street, Boston, Mass., on or before December 20th.

GEORGE BURDETT FORD

GEORGE BURDETT FORD

1879—1930

A STAR OF THE first magnitude in the galaxy of who's who in civic affairs has passed from view.

Son of a New England schoolmaster, Mr. Ford's brilliant record in architecture and city planning at home and abroad, as evidenced by the long list of his responsible connections with important national and international organizations, justifies the claim that he had a successful career in spite of the fact that its untimely ending at the age of fifty-one makes his remarkable record of achievement seem but a deep and broad foundation for that greater public helpfulness to which he aspired.

Endowed with unusual intelligence, his health, energy, honesty, industry, courage and ability to work with other people, combined with his shrewd estimate of his own capacity and limitations, are the important factors in his success. The absence of erratic and extravagant ideas in his work, a sort of inspired practicality, made his service to the world of a fundamental type to which communities turned with relief in preference to showy and speedy methods for producing results.

Mr. Ford's interest in city planning was aroused by research incidental to the preparation of his thesis design for *A Tenement in a Large City* at the Ecole des Beaux-Arts, Paris, 1907. His addresses and discussion at meetings of the National Conference on City Planning about twenty years ago were largely concerned with housing. At that time he was a member of the architectural firm of George B. Post & Sons, of New York and Cleveland, where he managed their branch office. Also at that time he was an associate member of the American Institute of Architects and a member of its town planning committee. His efforts to further consideration of æsthetics met with opposition in city planning circles and it was with some reluctance that he acquiesced in the decision to stress the practical economic value of city planning; but when the decision was made to do so he supported it loyally for nearly a decade. Upon his election as president of the American City Planning Institute, however, a policy of open recognition of æsthetic and social values was adopted and since his administration closed these factors have also been recognized as valid reasons for city planning. Since his appointment in February, 1930, as General Director of the Regional Plan Association, Inc., of New York, he has had the ideal of civic design constantly in mind and although he felt that there are many practical considerations of an engineering nature that must precede any application of the principle of architectural control, nevertheless, he initiated through that organization many projects for civic embellishment in the New York region that display great ability as an architect. This broad service, together with his administrative ability, makes his death an incalculable loss to the architectural and city planning professions.

To the public Mr. Ford was always accessible and, in the opinion of the writer, would have been an excellent ambassador; as a fellow worker he was always open to suggestion and never spared himself; as a teacher he preferred the lecture platform and writing as a medium of expression rather than debate, with the result that personal salesmanship was not one of his accomplishments; as a friend he will be missed by the author of this humble tribute as an elder brother.

Chevalier de la Légion d'Honneur, in death we salute thee.—*Harry B. Brainerd.*

THE NEW YORK ARCHITECTURAL CLUB, INC.

Atelier News

The brush slingers in the Atelier of the New York Architectural Club are about to embark on another one of those successful annual costume dances, which in the past have always gone over with a bang.

This dance will be held in the lounge of the Club, 118 East 42nd Street, on Thanksgiving Eve, November 26, 1930.

The proceeds of this dance will be used to enlarge the atelier library, and supply other needs of equipment.

Tickets can be obtained at the Club.

John W. Knoble,
Massier.

A COMPETITION FOR SMALL SCULPTURES

A Competition for Small Sculptures, to be executed in Rosenthal china, has been announced by the Art Alliance of America.

A first prize of $1,500. will be awarded, a second prize of $750., a third prize of $500., and two special awards, one of $500. and one of $250., will be given.

The competition is open to all residents of the United States. Models will be received by the Art Alliance of America between January 14th and 20th, 1931. For a copy of the program of the competition write to the Secretary, Ceramic Sculpture Design Competition, Art Alliance of America, 65 East 56th Street, New York.

LOS ANGELES COLLEGE OF ARCHITECTURE AND ENGINEERING

The Los Angeles College of Architecture and Engineering commenced activities on September 2nd, last.

The purpose of this college is to give a complete system of practical training to prepare students as architectural and engineering draftsmen, to provide advanced instruction for those already qualified as draftsmen who wish to extend their knowledge, and to prepare candidates for the State Board Examination necessary to secure a license to practice architecture or engineering.

The course includes architecture, structural engineering, and civil engineering.

In addition to the day course evening classes are held. The College is located at 2256 Venice Boulevard, Los Angeles, California.

ONE OF THE DRAFTING ROOMS OF LOS ANGELES COLLEGE OF ARCHITECTURE AND ENGINEERING

"A WAR MEMORIAL," LILY HALL McLUCKIE, SCULPTOR

The design for a War Memorial shown above has been accepted as the Gold Star Mothers' Memorial for New York State. Dr. Emma L. Balcom, the National Organizer of the Gold Star Mothers, says that the Committee hopes to place the monument in Washington, D. C., as a national memorial. This model was shown at the Spring Exhibition of the National Academy of Design, 1930.

PRATT ARCHITECTURAL CLUB, INC.

The Pratt Architectural Club's annual fall dinner will be held at the Fraternity Club's Building, New York, on Wednesday evening, November 19th. Mr. Ralph Walker, of the firm of Voorhees, Gmelin, and Walker, will be the speaker of the evening.

The Club's annual smoker was held at the Fraternity Club's Building, October 22nd. Over a hundred members turned out. Mr. Kenneth Reid, Associate Editor of Pencil Points, as guest of the Club, concluded the program with a brief talk.

THE ARCHITECTURAL SKETCH CLUB OF CHICAGO

The Architectural Sketch Club is one of the oldest professional organizations in Chicago, but it caters primarily to the younger draftsmen and students and its aims are almost entirely educational. The Club is forty-six years old, having been organized in 1884.

Its principal activity is the Atelier which is presided over by Patrons A. S. Adams and Donald S. Nelson.

In addition to the regular competition of the Beaux-Arts Institute of Design, the Atelier conducts several prize competitions yearly and in the Spring conducts the Annual Foreign Scholarship, which provides $1,200, through the generosity of the Chicago Chapter A.I.A., Illinois Society of Architects, and the Chicago Architects Club.

Minor activities of the club include lectures and talks by prominent men in the architectural and building field and social affairs for the club members and their friends twice a year.

There is a three-months' class in structural design to aid members in passing the State Board Examination for Architects' Registration.

A quota of about three hundred and thirty active, senior, and non-resident members indicates that the club fills a definite need in Chicago's architectural life and that the club is striving to do its share in raising the standard of architectural design and practice in Chicago.

A NEW BOOK AND PRINT SHOP IN THE CITY OF NEW YORK

THE ENGLISH BOOK SHOP has recently opened at No. 55 East 55th Street. The stock consists of rare books, private press issues, first editions of modern authors, also a selection of current English and American books.

In addition to the books there will be found at this delightful shop a fine selection of prints, both European and American, old as well as modern.

The English Book Shop offers a service which should appeal to collectors located at a distance from New York. Special orders are solicited from collectors for rare items, especially those of European origin, as the proprietors have unusual facilities for locating and securing rare books and prints. Correspondence is invited.

The English Book Shop will also hold a series of small exhibitions during the season, to be announced later, the first devoted to all the books illustrated by Mr. Rockwell Kent, with a selection of original drawings.

NEW YORK SOCIETY OF ARCHITECTS

THE NEW YORK SOCIETY OF ARCHITECTS has extended its activities so as to admit into its body an auxiliary organization or Junior League. This is intended to be of benefit to the draftsmen or junior architects who are not yet registered under the law.

The object of this new organization is principally educational and partly social. A program for the winter season covering the following subjects has been arranged: *The Education of an Architect, The Functions of an Architect and his Relations to the Client, Modern Tendencies in Design, Methods of Studying a Project Beginning with the Sketches, Taking of Estimates and General Practice of Letting Contracts, Supervision of Work in Field, Technique of Writing Specifications, Office Administration, Organization and Cost of Producing Drawings, Selection of Building Materials, Legal Standpoint of the Profession.* The work is in the hands of Colonel Louis E. Jallade. He has selected a group of architect leaders in the City to give these talks. These men have been chosen because of their marked ability in the particular subject on which they are to speak.

Admission to the lectures is open to all draftsmen who are interested applying to Louis E. Jallade, 15 East 47th Street, New York, N. Y.

The first lecture covered *The Education of an Architect*, and was given by Mr. Coe, formerly associated with Carrere & Hastings. The lecture was held at the Murray Hill Hotel, New York.

The next talk will be given by Mr. Arthur Holden on December 16th.

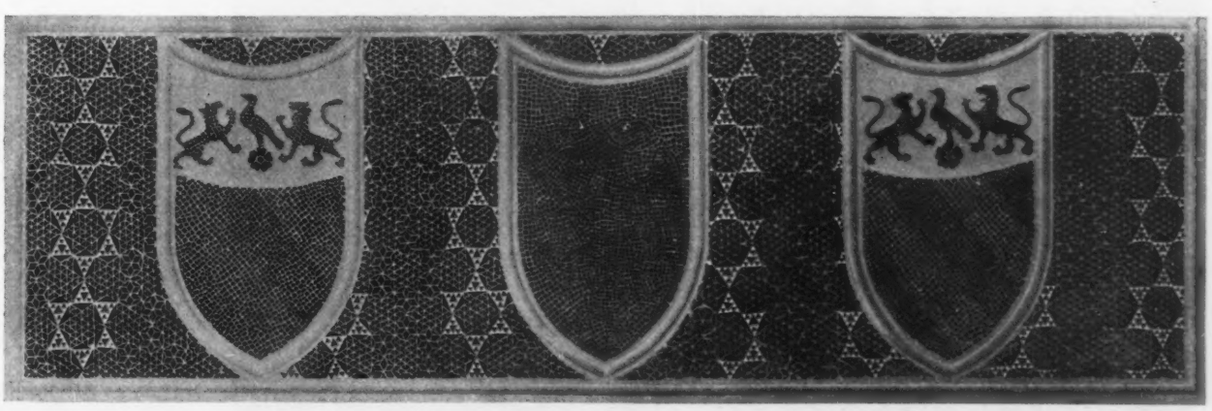
ENGINEERS' BOWLING LEAGUE OF CHICAGO

STANDING OF THE TEAMS

		W	L	Total	Av.
1	Holabird & Root, No. 1	3	0	2393	798
2	Utilities Power & Light	3	0	2306	769
3	J. H. Heuser	3	0	2290	763
4	City of Chicago Hydraulics	3	0	2183	729
5	W. H. Keen & Company	2	1	2424	808
6	Delta-Star Electric Company	2	1	2391	797
7	Mississippi Valley Engineers	2	1	2317	772
8	Allen & Garcia	2	1	2104	701
9	City Engineers	2	1	2072	691
10	Mississippi Valley Drafting	2	1	2039	680
11	Sargent & Lundy, No. 1	1	2	2453	817
12	Sargent & Lundy, No. 2	1	2	2302	767
13	Roberts & Schaeffer, No. 1	1	2	2243	747
14	American Association of Engineers	1	2	2124	708
15	Burrell Engineering Company	1	2	2030	677
16	Roberts & Schaeffer, No. 2	1	2	1883	624
17	Bethlehem Steel Company	0	3	2232	744
18	American Bridge Company	0	3	2206	735
19	Childs & Smith	0	3	2010	670
20	Holabird & Root, No. 2	0	3	2006	668

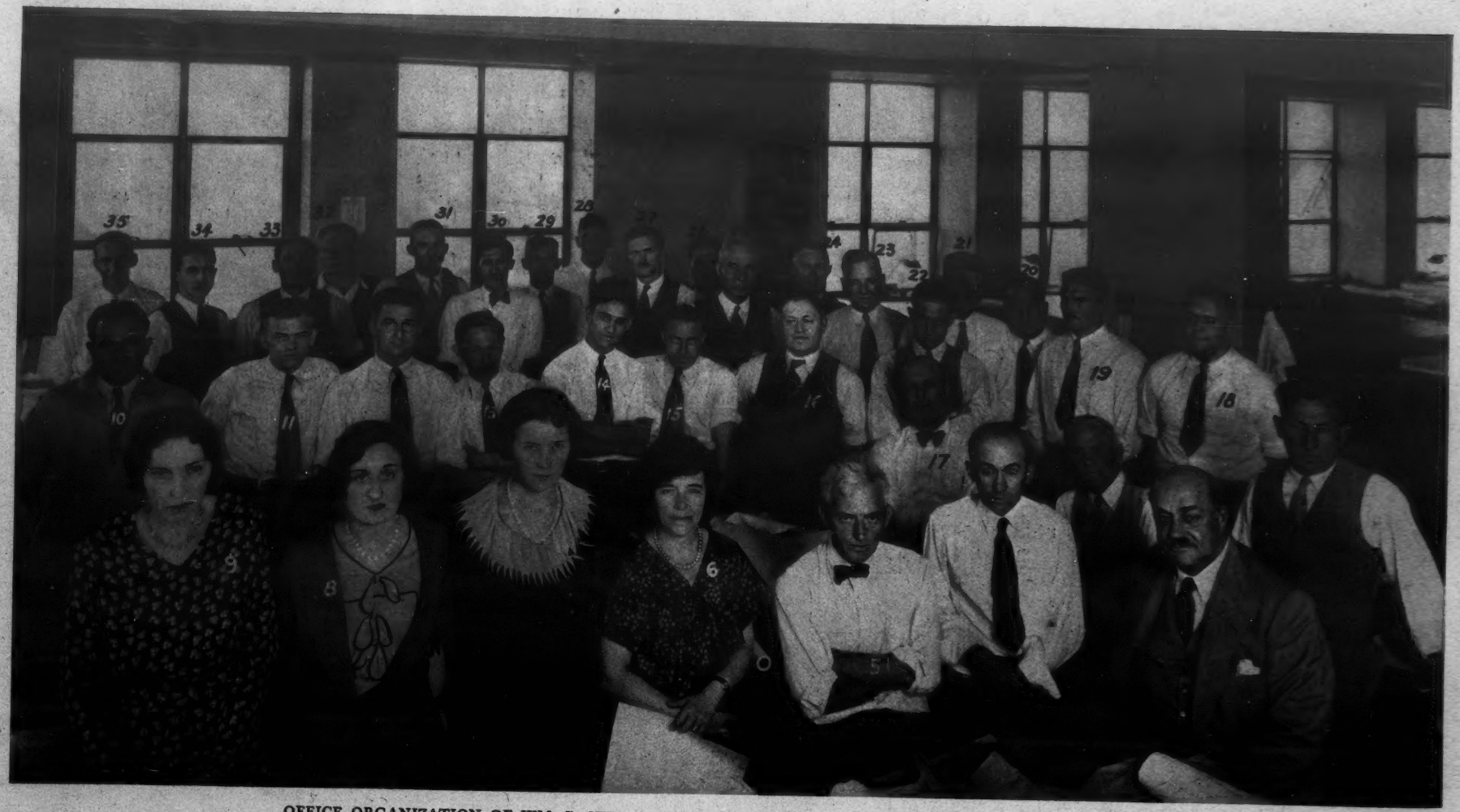
ACKNOWLEDGEMENT

THE DRYPOINT of Notre Dame by Morris Henry Hobbs, reproduced as one of the plates in this issue, is presented through the courtesy of Francis H. Robertson, Inc. This information was received too late to be inserted in the usual place under the plate.



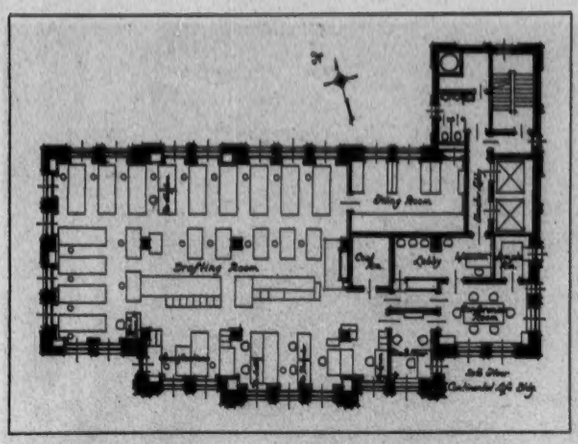
COPY OF MOSAICS IN CHURCH OF SANTA MARIA IN ARACOELI, ROME—BY LOUIS PIROLA

This drawing was made by Mr. Pirola while in Europe on the Chicago Architectural Club Scholarship. The original measures 6'6" x 2'4". The patterns of the mosaics were transferred by covering the original with detail paper and rubbing over it with lead. The sections were then mounted upon a large sheet of paper and painted. Each tessera was painted separately with tempera mixed with gum arabic and glycerine to keep the colors raised when dry and retain a gloss. The mortar joints between the tesseræ were painted in flat with gouache.



OFFICE ORGANIZATION OF WM. B. ITTNER, INC., ARCHITECTS AND ENGINEERS, ST. LOUIS, MISSOURI

1—*R. G. Alexander, Struct. Eng. (Vice Pres. and Management)*, 2—*Wm. B. Ittner, Architect, F.A.I.A. (President)*, 3—*R. W. Smith, Mech. Eng. (Vice Pres.)*, 4—*Robt. W. Lemon, Attorney (Secy.)*, 5—*D. Stephen, Architect, A.I.A. (Vice Pres.)*, 6—*Mrs. A. Donovan, Telephone Operator*, 7—*Miss E. Ventriss, Stenographer*, 8—*Miss M. Fillo, Stenographer*, 9—*Miss H. Cunningham, Stenographer*, 10—*B. J. Applegate, Archt. Draftsman*, 11—*Chas. W. Huning, Archt. Draftsman*, 12—*Geo. Horch, Mech. Draftsman*, 13—*B. J. Mick, Draftsman*, 14—*Arthur Rathert, Draftsman*, 15—*W. W. Pistor, Draftsman*, 16—*M. H. Dodge, Archt. Draftsman*, 17—*F. W. Dimmit, Mech. Draftsman*, 18—*Wm. B. Ittner, Jr., Architect, A.I.A. (Assistant Management)*, 19—*E. A. Neuman, Engineer*, 20—*R. M. Hare, Engineer*, 21—*Wm. R. Rummel, Field Supt. of Construction*, 22—*Robt. R. Jacobsmeyer, Draftsman*, 23—*V. A. Boeke, Field Supt. of Construction*, 24—*J. F. Powell, Field Supt. of Construction*, 25—*W. H. Foster, Specification Writer*, 26—*Gilbert Rosenbach, Draftsman*, 27—*Alfred Hupfeld, Draftsman*, 28—*F. C. Whitney, Engineer*, 29—*O. H. Rothe, Draftsman*, 30—*Paul Veit, Archt. Draftsman*, 31—*R. D. Henderson, Archt. Draftsman*, 32—*Hollis Schwarz, Draftsman*, 33—*Carl N. Atkinson, Specification Writer*, 34—*E. R. Murphy, Filing Clerk*, 35—*Fred Boeke, Equipment Specialties. Men in Field not included in Photograph: W. E. Irving, Field Representative, Field Superintendents of Construction, Dan H. Dean, T. C. Epps, C. A. Glocker, H. R. Hancock, R. S. Kastendieck, E. O. Smith, E. B. Whitney, W. R. Wilson.*



FLOOR PLAN, OFFICE OF WILLIAM B. ITTNER, INC.

(See page 908 for photograph of office force)

NEW YORK-PHILADELPHIA INTER-CITY BASEBALL CHAMPIONSHIP

THE NEW YORK ARCHITECTURAL CLUB, INC., All-Star Baseball Team made the trip to Philadelphia on September 27th to play the all-star team selected from the Philadelphia Architects' Baseball League by Chief Dryer, President of the Philadelphia League.

A. A. Penfold, President of the New York Baseball Team, and Pop Scheffer's fast aggregation of ball tossers arrived at Broad Street Station, Philadelphia, at 11:00 A. M. After luncheon the two teams were immediately motored to the Philadelphia Rifle Club Field at 8th Street and Labor Road, Philadelphia, where 5,000 excited fans were waiting for the battle between the two architectural teams. It was the Third Annual Inter-City Baseball Championship between New York and Philadelphia, New York having won in 1928 and 1929. The game started promptly at 3:30 P. M., with Long pitching for the visitors and Jeffries for the home team.

The feature of the game came in the ninth inning with the score three to three and a man on second for the home team with two outs. Scheidhauer, up as a finish hitter, drove a line drive to deep center. Wahle recovered the ball and with a lightning throw to Carlisle caught the Philadelphia runner by two feet at the home plate, holding the score three to three, which made it necessary to play an extra inning, the final score being five to four.

The score was as follows:

NEW YORK

	AB	R	H	O	A	E
Santonassimo—3rd.	5	1	0	6	3	1
Stenger—R.F.	5	0	0	3	0	0
Wahle—Capt.—C.F.	5	1	1	1	3	1
Anderson—S.S.	3	1	1	0	3	0
Brinkerhoff—2nd.	5	1	1	5	0	0
Stevens—L.F.	3	1	1	1	1	0
Carlisle—C.	4	0	2	5	0	0
Butler—1st.	4	0	0	8	1	0
Long—P.	4	0	0	1	3	1
Rockford—Sub.						
Bader—Sub.						
Forrester—Sub.						
	38	5	6	30	14	3

A. A. Penfold, Pres. of League—M. L. J. Scheffer, Coach.

PHILADELPHIA

	AB	R	H	O	A	E
Reihert—2nd.	1	0	0	1	1	3
Doan—2nd.	2	1	0	3	2	0
Franks—C.	5	0	0	10	2	0
Hagan—1st.	5	0	0	13	1	0
Boozer—C.F.	5	1	1	1	0	0
Beck—R.F.	5	1	2	1	0	0
Williams—Capt.—S.S.	4	0	2	0	1	1
Reinhart—3rd	3	0	0	2	4	0
Crooks—L.F.	1	0	1	0	0	0
Montgomery—L.F.	2	0	1	0	0	0
Jeffries—P.	4	1	0	0	6	0
Munuon—C.	1	0	0	0	0	0
Pfender—P.						
Scheidhauer—3rd			1			
Lorenz—UT.						
Thompson—UT.						
Rueter—Mgr.						
	38	4	7	31	17	4

M. M. Dryer, Pres.—J. E. Doan, Jr., Sec't.—W. J. Rankin, Treas.

Home Runs—Anderson.

Two-Base Hits—Stevens, Wahle, Crooks.

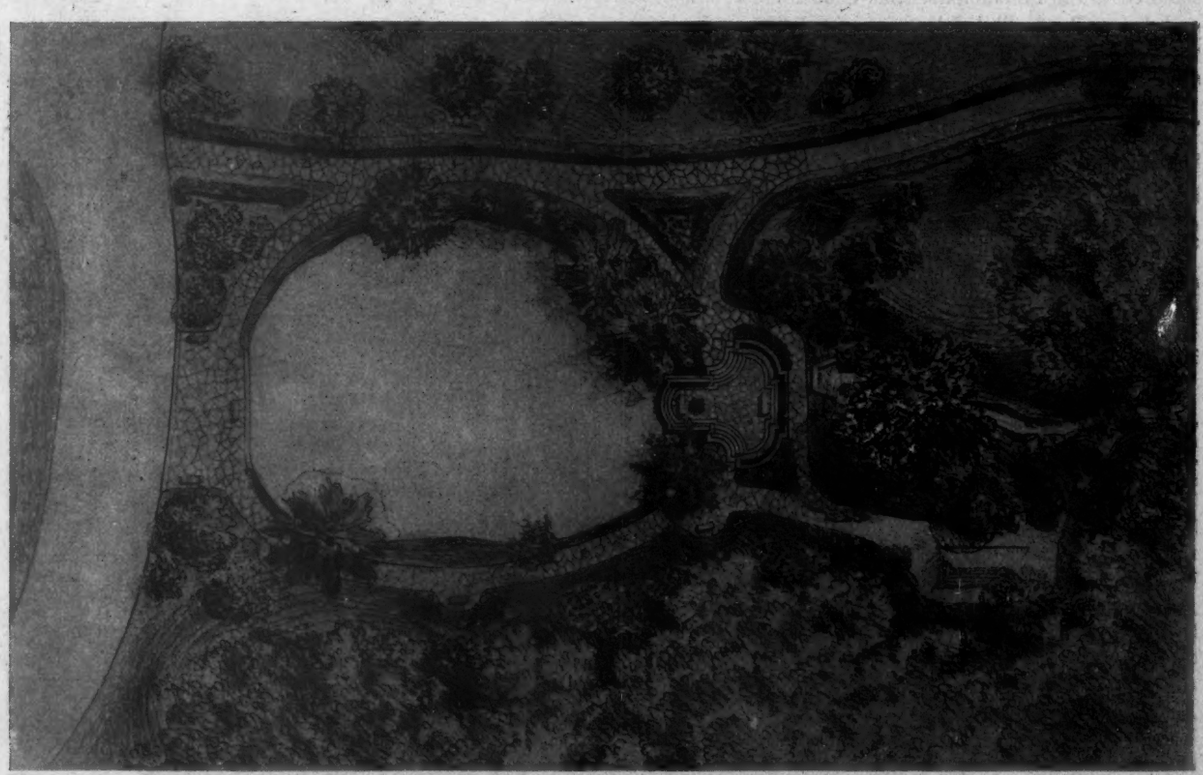
Strike-Outs—Jeffries 9, Long 11.

Base on Balls—Jeffries 5, Long 2.

P. M. Lynch—Official Scorer—Time, Two Hours.

We desire to take this opportunity to thank those members of the Allied Arts and Trades who by their kind co-operation and contributions have made this game possible as an annual affair.

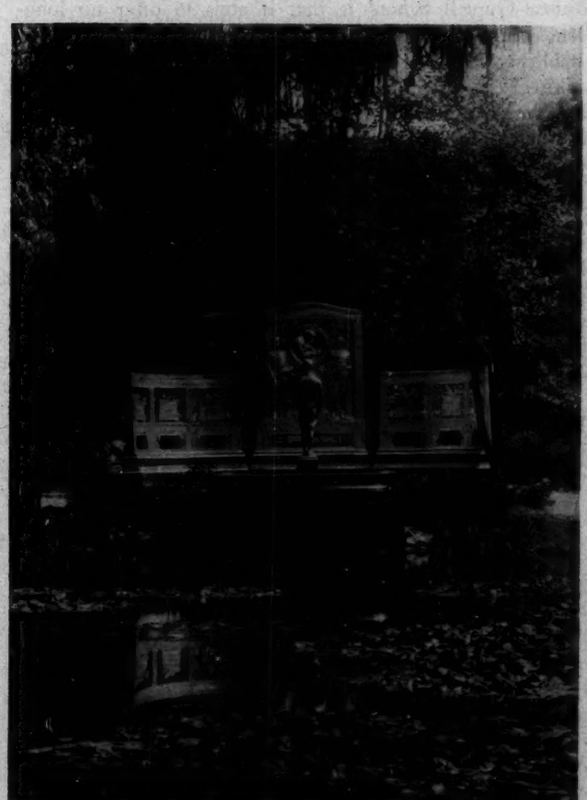
A PEN-AND-INK DRAWING BY ARTHUR L. IVERSON

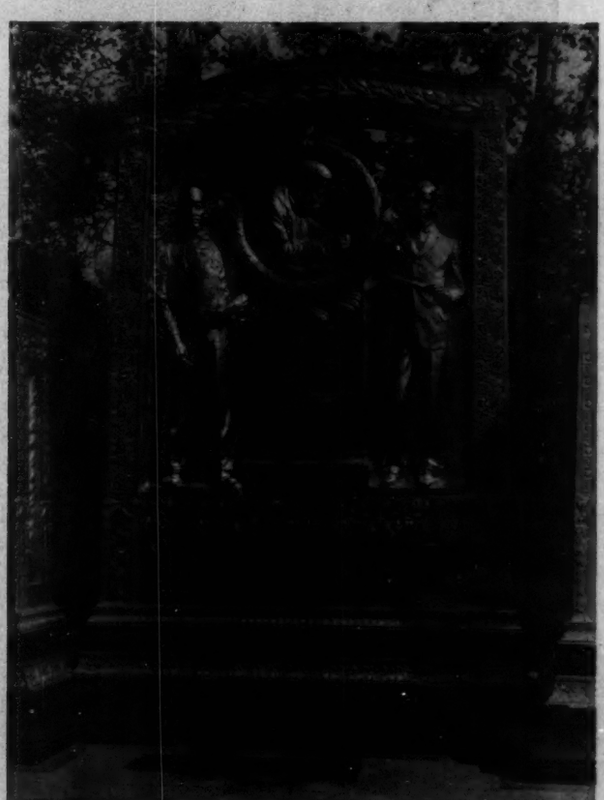


SKETCHES MADE BY HENRY HORNBOSTEL, ARCHITECT, FOR THE GEORGE WESTINGHOUSE MEMORIAL IN PITTSBURGH, PENNSYLVANIA

(See text on page 913)

THE REAR OF THE MEMORIAL SHOWING THE UNIQUE SCULPTURAL EFFECT





MEMORIAL TO GEORGE WESTINGHOUSE IN PITTSBURGH, PENNSYLVANIA

HENRY HORNBOSTEL, ARCHITECT; DANIEL CHESTER FRENCH, SCULPTOR; PAUL FJELDE, SCULPTOR

(See text on page 913)

RENDERING IN PENCIL AND CHARCOAL
BY EUGENE MARUGG

Projected design for an eighty-five-story skyscraper proposed for the site of the Hotel Belmont, New York—George and Edward Blum, Architects.

NEW ART SCHOOL IN BROOKLYN, N. Y.

THE NAMES OF Ernest W. Watson and Arthur L. Guptill have so long been familiar to readers of PENCIL POINTS that the announcement elsewhere in this issue that they have joined forces to organize a school known as the Watson-Guptill School of Art is of particular interest.

While Mr. Watson is perhaps best known to our readers for his delightful and instructive Eldorado Page, it is his work in creative art, and particularly in block printing, which has brought him general recognition. His volume, *Linoleum Block Printing*, was accepted as authoritative as soon as it came from the press. As an educator Mr. Watson's experience has been long and successful. For many years he has been a member of the general faculty of the School of Fine and Applied Arts, Pratt Institute, Brooklyn, N. Y., where he is at present Supervisor of the evening courses in Art, Architecture, and Interior Decoration, and an instructor in the day classes. He was co-founder and director with Raymond Ensign of the Berkshire Summer School of Art, with which school he served over a long period.

Mr. Guptill, though an architect, had training as an artist. He has long been known to PENCIL POINTS' readers for his sketches of architectural subjects in the advertising pages. His books, *Sketching and Rendering in Pencil*, and *Drawing with Pen and Ink*, are evidences of his activities along educational lines, for he, like Mr. Watson, has long been connected with Pratt. Ever since 1912 he has served there as a part-time instructor in architecture and interior decoration while carrying on his professional work.

A unique feature of the architectural department of the Watson-Guptill School is that it aims to offer no long-term courses in architecture, competing with those already established elsewhere, but instead to help the draftsman or architect to strengthen his weakness in some particular direction through a comparatively short, intensive course. To make possible this accomplishment a group of courses will be offered, many of them in the evening or on Saturday afternoons. Classes are now forming, for instance, not only in elementary and advanced architectural drafting but in such special subjects as architectural shades and shadows, practical perspective, sketching and rendering, specifications, estimating, and the like. The school welcomes suggestions for courses and invites correspondence. Address the Watson-Guptill School of Art, 209 Washington Park, Brooklyn, N. Y.

EBERHARD FABER OFFERS ART SCHOLARSHIP

EBERHARD FABER PENCIL COMPANY has announced an important competition open to high school students for drawings made with Mongol Colored Indelible pencils.

The first prize is tuition for two years in the finest art schools—first year in America, the second year in Europe. Second prize is $200 toward one year's tuition in a leading American art school; third prize $75 cash; fourth prize $25 cash. Contest ends January 31st, 1931.

Prize winners will be announced in April, 1931, issue of trade and art magazines.

The judges will be: James C. Boudreau, Director School of Fine and Applied Art, Pratt Institute, Brooklyn, N. Y.; William M. Odom, President New York School of Fine and Applied Art (Parson's), New York; Felix Payant, Editor Design Magazine, Professor of Art, Ohio State University; Joseph Wiseltier, Connecticut State Director of Art.

Full details may be obtained from Eberhard Faber Pencil Company, Scholarship Dept., 37 Greenpoint Avenue, Brooklyn, N. Y.

GEORGE WESTINGHOUSE MEMORIAL

THE MEMORIAL TO GEORGE WESTINGHOUSE was unveiled at Schenley Park, Pittsburgh, on October 6th. The monument was designed by Henry Hornbostel and Eric Fisher Wood, Architects, and consists of a large central panel flanked by two semicircular wings, all of which are made of gold-leafed bronze with Norwegian granite insets. The central panel, of which Daniel Chester French is the sculptor, carries the medallion of George Westinghouse, supported on an open work background of oak tree foliage; on either side are two figures, one a skilled mechanic and one an engineer with his slide rule. Both the portrait and the figure are modelled in full relief. The rear of this panel shows the back of the two figures as well as the conventional design of the oak tree, the panel being worked in full relief on both sides. This was done to avoid constructing just a front and to make the rear view, which is seen as one follows the path leading down the valley, as interesting as the front. This effect is shown in the photograph on page 911.

Each of the flanking wings is divided into three panels, executed by Paul Fjelde, sculptor, and on each is depicted in low relief one of Mr. Westinghouse's achievements.

Standing well back from the panels and facing it is the figure of the American Youth, modelled by Daniel Chester French. This is of heroic size and is of gold-leafed bronze to correspond with the rest of the memorial.

Special attention has been given to the landscaping of the surroundings of the memorial, as its setting was considered as important as any other detail. The building of the paths, the profuse planting of rhododendrons and countless other shrubs, the removal of trees that marred the general effect and the careful preservation of those that added to it, the placing of Norweigan granite benches, the creation of the pond formed by the stream that trickles out from under the memorial itself—all of these help to bring about a complete artistic ensemble.

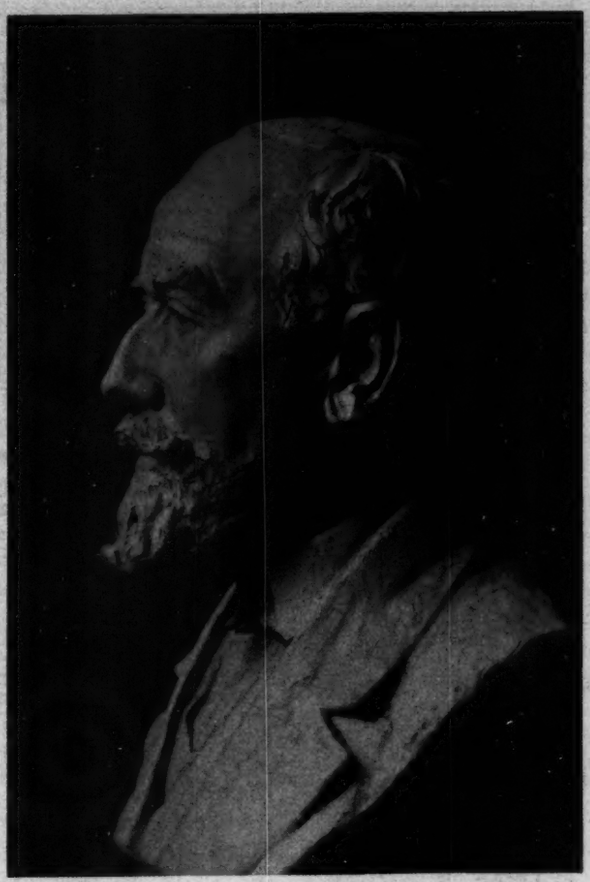
A REPLY TO MR. ZICHNER

By C. A. STEWART

Chief Engineer, Anti-Hydro Waterproofing Co.

WE HAVE OBSERVED, with some astonishment, a statement by Mr. Hugo Zichner in your September [page 744] number, to the effect that it is common practice in New York to leave weep holes after waterproofing operations are completed. Mr. Zichner contends that the water flowing through such weep holes carries off the lime of the cement and weakens the concrete.

In an experience of more than 15 years with various waterproofing problems throughout the East, the writer has never seen weep holes left open for more than a few hours after the completion of waterproofing work. That such a practice could be "common" seems utterly impossible, since weep holes are useful in only one type of waterproofing—the plaster coat method, sometimes referred to as the hydrolithic method. Even in this method, weep holes are only used when the wall leaks so badly that the plaster cannot be made to adhere. Then it is customary to cut into the wall at regular intervals and insert small lengths of pipe which are sealed in the wall and project 4″ or 5″ beyond its surface. The object is to localize the leaks in the wall so that the adjoining areas may be properly plastered. But as soon as the final coat is thoroughly set, these drain pipes are removed one by one, the opening plugged and the surface smoothed off even with the surrounding plaster. This operation is completed just as soon as the condition of the plaster will permit and certainly by the day following the application of the plaster.



PORTRAIT BUST OF HENRY HORNBOSTEL
PAUL FJELDE, SCULPTOR

Even in plaster coat jobs the necessity for weep holes or drains occurs infrequently, so that their use could hardly be called common, much less the practice of leaving them open.

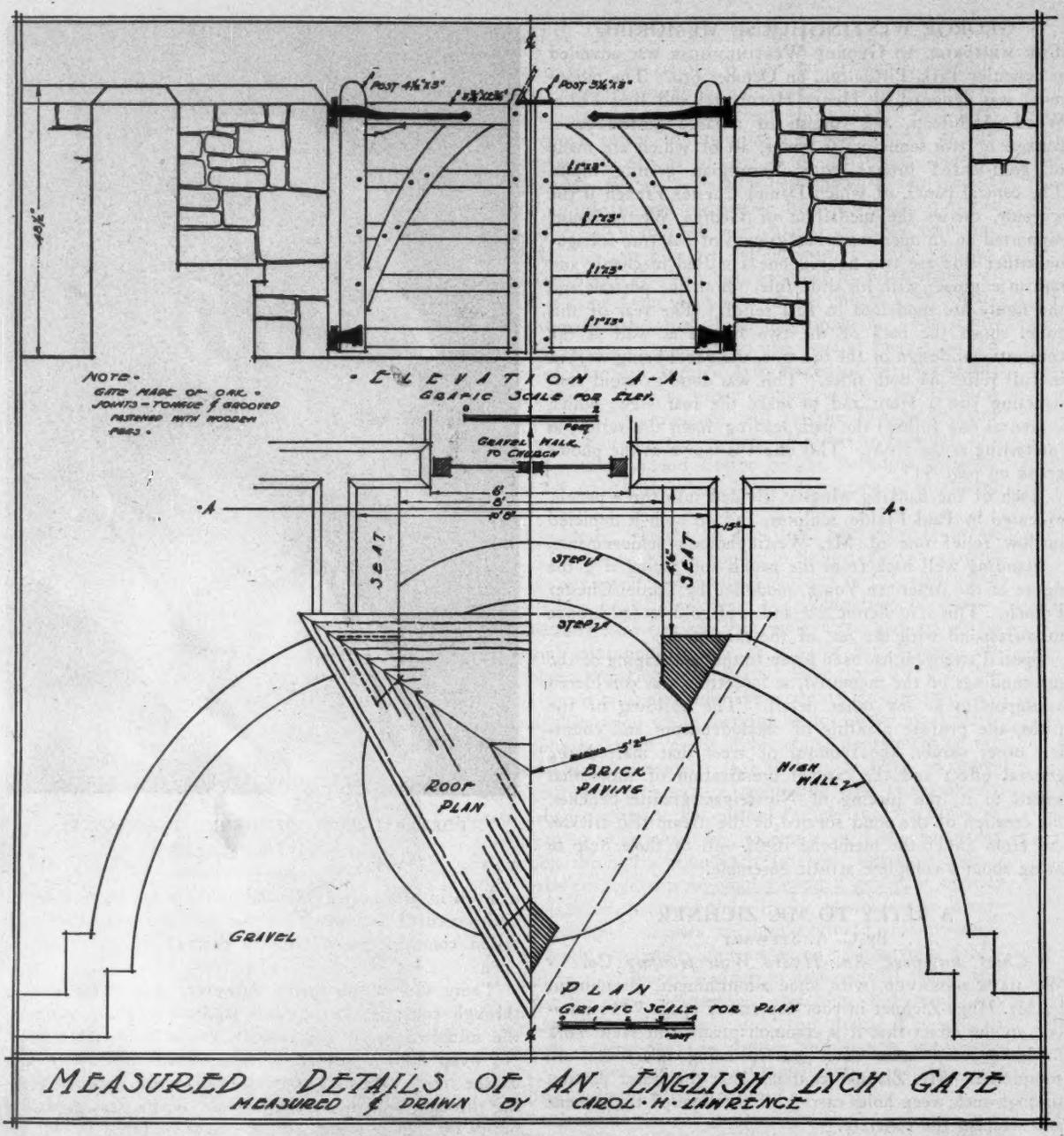
There can be no doubt, however, that water passing through concrete does dissolve and carry along some of the soluble salts of the cement, probably the free lime. No weep hole is needed to demonstrate this. Any spot on the inside face of a concrete wall, where water is seeping through, will soon show a white deposit that gradually builds up. Where such seepages have occurred in ceilings we have known stalactites to form 8 or 10 inches long. Whether or not this action seriously weakens the concrete as Mr. Zichner contends, we do not know, but we would doubt it. And we are certain that no reputable waterproofing contractor leaves weep holes open for any appreciable time after completing his waterproofing operations.

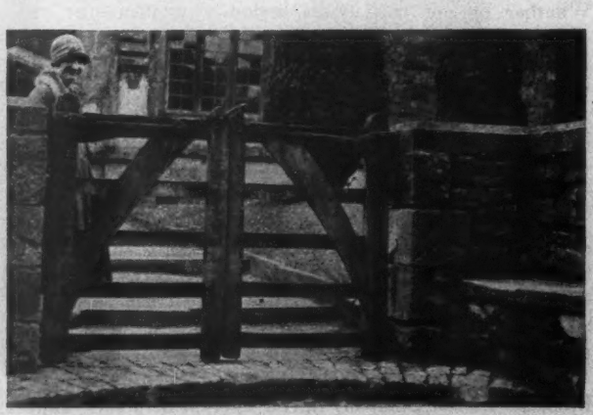
BROOKLYN CHAPTER, A.I.A.

THE OCTOBER DINNER MEETING of the Brooklyn Chapter of the American Institute of Architects was held on Monday, the 27th, in the auditorium of the Brooklyn Edison Company's building. The dinner marked the opening of an exhibition on the main floor of this building during the entire week including Saturday, Nov. 1st.

This exhibition was held through the kindness of the Brooklyn Edison Company in conjunction with their annual lighting exhibition.

The hanging of the work of the members of the Brooklyn Chapter was in charge of the Current Work Committee of which Henry V. Murphy is Chairman.





MEASURED DRAWING BY CAROL H. LAWRENCE—PHOTOGRAPHS BY HANNAH I. CHAMPLIN

FURTHER LETTERS ON "THE VALUE OF THE ARCHITECT'S SERVICES"

EDITOR'S NOTE:—*Comments on our proposed document, published in the July issue of* PENCIL POINTS, *still come in from architects in all parts of the country. They are very helpful to us in carrying on the work of revision. A selection of those received recently, quoted below, may be of interest to our readers as evidence that architects everywhere are still thinking about the problem. We appreciate their assistance and invite further suggestions.*

From HENRY C. COLLINS, *Architect, of Palo Alto, Cal.*

"I have followed your educational campaign and have read the material for the proposed booklet with a great deal of interest. My reaction is that you are on the way to producing something splendid. How such a booklet could harm the profession, as your comments say one architect objected, is beyond my conception. That there should be comments of 'too long' is inevitable in this day of short hair and short everything else. The cry that it is too long is a patent criticism of anything written. I agree with your answer to this that you must take space to convey your message. And there is where the only criticism which I have comes in.

"The average person must be inviegled into reading a long message of this sort. Every means and device must be used to excite and carry on the interest. I like particularly your layout with an illustration on the reverse of each page. I would make this typical of every page throughout the booklet. Now, in the text of your message the language, of necessity, must be somewhat technical and matter-of-fact. But why would it not be possible to introduce the story element in the captions under the illustrations—put in as much human interest as possible; for surely architecture, which serves the second essential of human existence—shelter—must have human interest.

"I would take as my pattern National Geographic, one of the most popular periodicals of our time but one which the most hide-bound of architects could not criticize for lack of dignity. When I pick up a copy of National Geographic I look at the illustrations and read the captions. If my interest is aroused I read the accompanying article. Don't you think that my case is a typical one? We must always bear in mind, as one architect has so aptly put it, the public is not so keen about being educated. No matter how excellent your booklet may be we cannot expect that a line will form outside your office as soon as publication is announced.

"That would be the only suggestion I have to offer. The text seems to me to be a perfect statement of the case. In some cases such as under 'What Does The Architect Do For You?' I think the solid pages of type might well be relieved with subtitles or inset titles—always remembering that Americans are a race of headline readers and yet these headline readers are those whom we want to reach."

From ANGELO B. M. CORRUBIA, A.I.A., *of St. Louis, Mo.*

"I have read with great interest and care your material regarding 'The Value of the Architect's Services,' as published in the July issue. I do not find anything to criticise and I hope that you will not be discouraged from going ahead with at least this much of your educational movement. I regret very much that your original plans have fallen through.

"Please advise if the literature that you propose to publish will be available for use by individuals."

From A. J. RUSSELL, A.I.A., *of Tacoma, Washington*

"Having carefully studied 'The Value of the Architect's Services' I believe the subject could not be treated more clearly and that it would be a great benefit to the profession to have the contents in brochure form, to present to those intending to build."

From WILLIAM C. NOLAND, F.A.I.A., *of Richmond, Va.*

"I wish to acknowledge with thanks your July number, containing the article, 'The Value of the Architect's Services.'

"As you requested comments upon it, I have intended to write you before this; but circumstances have prevented my doing so.

"I realize that the subject is a difficult one to present to the layman in a form sufficiently clear and at the same time sufficiently concise.

"I think the article is along the proper lines and very creditable as it is; but, in view of the nature and importance of the document, I think that no pains should be spared to get it as nearly perfect as possible before issuing it, and, in restudying it, to strive to reduce the length of it wherever possible.

"In Sec. 4, Page 574, I think that the statement that the registration laws provide against anyone calling himself an architect without having the proper qualifications would lead a layman to believe that any registered architect would necessarily have such 'proper qualifications.' He would doubtless have some sort of qualifications to get him by the state board of registration; but not necessarily the proper qualifications of a first-class architect. So I think this paragraph is misleading and should be revised. Also, in mentioning the patent laws, you might combine the examples, instead of mentioning them separately, and thus shorten the paragraph.

"On page 577, 4th paragraph, you say 'However, you now have before you the results of the preliminary study in the form of plans and a *perspective* pencil or water color sketch.'

"I would, by all means, leave out the word 'Perspective,' and say 'Plans and sketch elevations showing how the exterior will look.' Or just say 'Sketches showing the general appearance of the exterior,' without specifying whether the sketches will be in elevation or perspective. To specifically mention a perspective would lead the layman to think that such was customary and that he could therefore demand it of the architect, whereas such is not customary. Sketches are usually made in elevation. The architect does frequently make preliminary sketches in perspective, but that is optional with him and should not be mentioned as a service to be necessarily expected of him. For that reason I would strongly advise that you publish a sketch elevation either in place of the Bird's-eye Perspective that you show on Page 575 or else along with it on the same page."

THE DRAFTSMAN'S LIBRARY

PLATE 20
STRONG LINE DECORATIVE RENDERINGS FOR ADVERTISING ILLUSTRATIONS FROM EUROPE

SOME EUROPEAN POSTER DESIGNS

From "Modern Art—Commercial Art and Lettering"

Fundamentals of Architectural Design, by W. W. Turner; 175 pages, 60 plates and additional figures, size 11" x 15"; price $6.00; published by the McGraw-Hill Book Company, New York.

Reviewed by Wells Bennett

The beginner at architecture ought to welcome the presentation in one volume of the essentials of the elementary architectural subjects. This is such a handbook, setting forth what every young architect ought to know. Shades and Shadows, Perspective, The Orders, Rendering, and Lettering are all discussed with many excellent plates and figures and student exercises. There is also a glossary of architectural terms. A unified text has, beside compactness, the great additional merit of economy; one book takes the place of four or five.

It is a little difficult for one man to present such different subjects as mechanical perspective and color rendering with equal facility and inspiration. For the Orders nothing quite takes the place of Buhlmann, D'Espouy, and even Esquie's Vignola. In the chapter on lettering, too, the treatment is perfunctory and would need to be supplemented by good teaching, or such a book as F. C. Brown's *Letters and Lettering*. The Shades and Shadows portion of this work is the best, but all parts are good. The title may be a trifle misleading. The book treats of architectural drawing and rendering; of presentation but not of composition.

Modern Art—10 Portfolios, by Pedro J. Lemos; 32 plates in black and white and 4 color plates in each portfolio, 8½" x 11"; price $3.00 each; published by The School Arts Magazine, Worcester, Mass.

These ten portfolios were made up by Mr. Lemos to furnish students and designers with stimulative reference material in the so-called *modern* manner. They cover "Commercial Art and Lettering," "Decorative Design," "Etchings and Block Prints," "Exteriors—Buildings," "Interiors and Furniture," "The Art of the Book," "Novelties and Jewelry," "Lighting Fixtures and Iron Work," "Posters," and "Sculpture and Pottery." Each portfolio is procurable separately. The material was selected by Mr. Lemos from among thousands of examples collected abroad and represents what he believes to be the most typical and best examples under each heading. The specimens of commercial art and decorative design are particularly good, but all of the portfolios should prove useful to designers working in the fields covered.

Modern Poster Annual, 1931; a portfolio of 45 sheets, 10" x 13", upon which are mounted more than 100 designs in color; price $6.00; published by A. Broun, New York.

This portfolio, which is the seventh of the series to be published since Mr. Broun started it, presents a very well selected group of the year's best specimens of modern advertising designs in color. The designs are drawn from America and Europe and include work by many of the world's best known designers such as C. B. Falls, Boris Artzybasheff, Winold Reiss, Louis Fancher, Herbert Paus, John Sheridan, and others. Men interested in poster design and decorative commercial art will find this a useful collection.

History of the Campus Plan of the University of Illinois, 1867-1930, by Tilton and O'Donnell; 245 pages, 7" x 10½"; price $5.00; published by the University of Illinois Press, Urbana, Illinois.

Reviewed by Francis S. Swales

This interesting book, describing the process of planning the physical part of a great and rapidly growing institution, shows that a well conceived modern plan made twenty-five years ago, had it been carried out completely, would have been inadequate today.

"While we cannot hope that even the present excellent plan can be adhered to in every detail," writes President Kinley in the preface, "I am confident that the main outlines of the South Campus at any rate are fixed for years to come. Few institutions are so fortunate as to have had the benefit of so diverse an assemblage of talent and excellent advice from great architects and at the same time in the personnel of members of its staff a coordinating and unifying influence through a generation. The result is that the University has a workable campus plan, a correlated landscape plan, and a new architectural tradition."

The illustrations of plans and sketches representing the work of C. H. Blackall, who originated the idea, W. C. Zimmerman, J. M. White, whose endeavors kept it alive and in constant development, Holabird and Roche, Charles A. Platt, and others, the report of Mr. Vitale on the planting or "landscape," the collection of important letters,

and the reports of the Committees, all contribute to make this book an engaging study to architects and others interested in the larger phases of architectural planning of the proper relationship of groups of buildings in an effective and convenient arrangement. The plan of the University of Illinois is more than merely a plan of a group of buildings. It is the plan of a small city devoted to education.

Masterpieces of Architecture in the United States, by Edward W. Hoak and Willis Church, with a preface by Paul P. Cret; 225 pages, 13″ x 17″; price $20.00; published by Charles Scribner's Sons, New York.

"In preparing this collection of executed work," says Paul Cret in his preface, "the authors of this book, Messrs. Hoak and Church, have shown a very clear understanding of its requirements, and both in the selection of their material and in their exposition of it have displayed a discrimination and intelligence that is worthy of very high praise." We can heartily endorse this statement of Mr. Cret's for it seems to us that the volume is one of the best architectural books of the year—an almost monumental record of some of the finest achievements of American architectural effort. The buildings represented are the Lincoln Memorial, Washington; the Liberty Memorial, Kansas City; the Detroit Institute of Arts; the Freer Museum, Washington; the Boston Public Library; the Indianapolis Public Library; the Detroit Public Library; the Church of St. Vincent Ferrer, New York; the Madison Square Presbyterian Church, New York; the Nebraska State Capitol; the Pan-American Union, Washington; the Temple of the Scottish Rite, Washington; the Shelton Hotel, New York; the Hotel Traymore, Atlantic City; the Barclay-Vesey Building, New York; the Bush Building, New York; the Tribune Tower, Chicago; and the Woolworth Building, New York. These were selected by a jury consisting of Chester Aldrich, Harvey Wiley Corbett, Ralph Adams Cram, Paul P. Cret, Raymond M. Hood, William M. Kendall, H. Van Buren Magonigle, William Rutherford Mead, Milton B. Medary, and Harry Sternfeld—truly a formidable list of judges.

Each structure is shown by means of beautifully reproduced photographs and fine analytical drawings which may be read directly to scale. An analysis of the problem and its solution by the architect of each building adds greatly to the value of the work as a reference. Both the authors and the publishers are to be complimented upon the production of such a finished piece of work.

Wind Bracing, The Importance of Rigidity in High Towers, by Henry V. Spurr; 132 pages, 6″ x 9″; price $3.00; published by the McGraw-Hill Book Company, Inc., New York.

Reviewed by Francis S. Swales

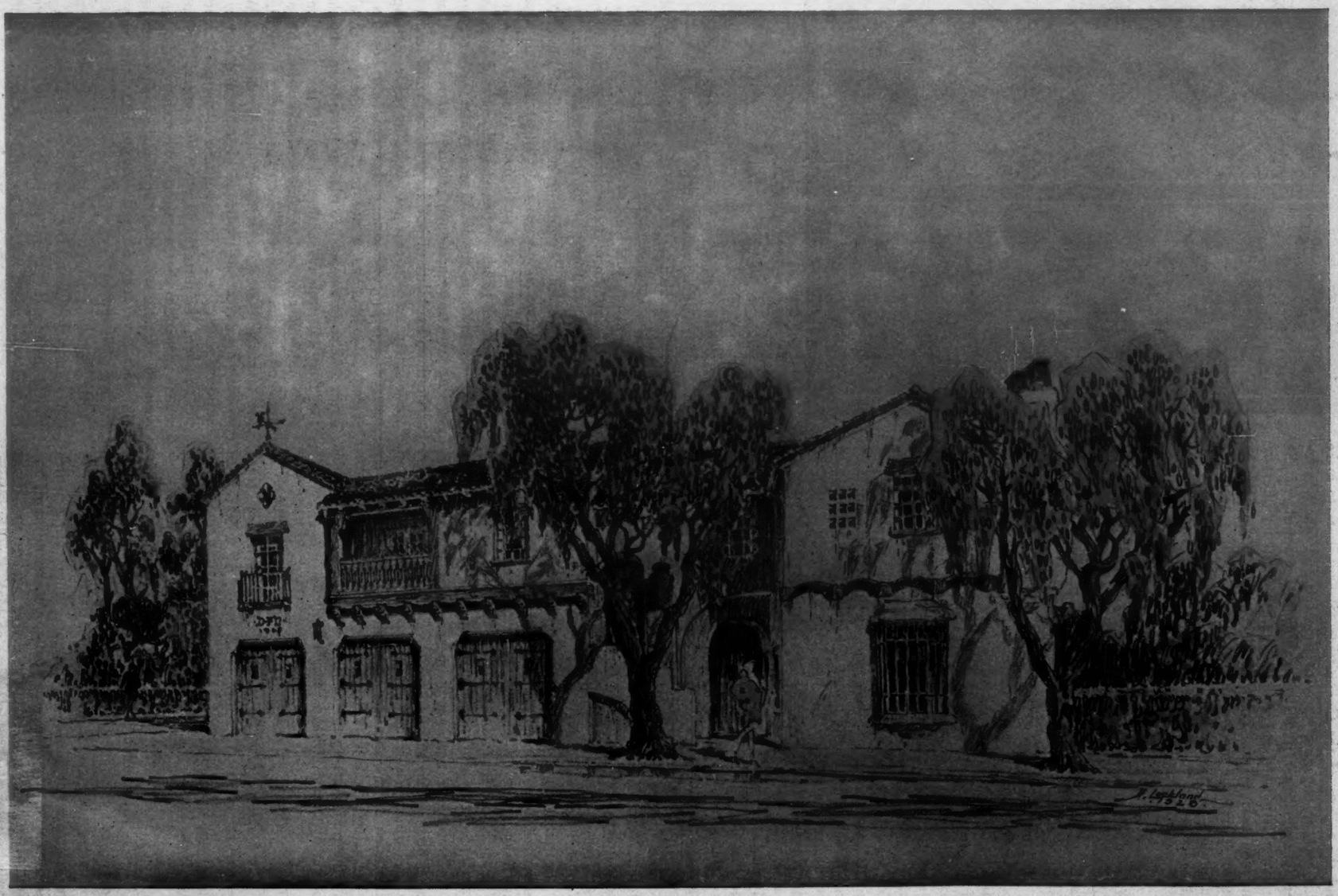
This is an excellent treatise upon a subject which has long needed the thoughtful consideration and care which this author has given to it. It sets a standard of design in this controversial phase of structural engineering which will stimulate discussion and a better understanding of the essentials of the problem of securing against unpleasant elastic behavior of the steel frame of high, slender towers.

The author thinks clearly, is a sound reasoner, and expresses himself so well that his general description of essential features of the subject is as easily read and understood as a news article in a well edited newspaper. It is a book that will be welcomed by architects, since even in those parts in which he deals with the more technical discussion of the fundamental principles of design and their application to the problems of the designing engineer, he holds to a minimum of mathematics not difficult to follow and to "simplified formulae to illustrate discussion."

GEOMETRIC TEXTILE PATTERNS
From "Modern Art—Decorative Design"

The "specification" which he submits, in Chapter X, for the consideration of owners and builders, as well as architect and engineers, is a particularly valuable new contribution of bases to ideas upon the subject and alone well-worth the price of the book, as a guide for procedure in dealing with the question of rigidity, as well as those of strength and stability of buildings against wind loads; since these latter are all that our building codes attempt to secure. His proposals are neither too bold nor too conservative; neither more nor less than the proper allowances and requirements in order to provide against the all too frequent troubles with leakage at the junctions of walls and roofs, especially at the set-backs of buildings with high towers, due to insufficient consideration of rigidity in the frame and proper bracing at the connections. While we may not expect such valuable advice to find its way into building codes, since it is no business of the public authorities to guard the financial interests of owners, it is not too much to expect that architects who study Mr. Spurr's recommendations will place them in their office codes as the best that have been evolved to date upon this very important problem.

Mr. Spurr, as Chief Engineer of Purdy and Henderson Company, Consulting Engineers, is already so well known to the architectural profession as a practical designer of steel work as to require no introduction here; but his treatment of the subject of Windbracing in this volume will add more than a little to the esteem in which he is held. It is not too much to predict that this little volume is destined to become a standard work.



FIRE HOUSE FOR DIXON FIRE DISTRICT, DIXON, CALIFORNIA—RENDERING IN PENCIL AND WATER COLOR BY HARRY LOCKLAND

DESIGNED BY HARRY LOCKLAND AND GEORGE J. ROSSI

HERE AND THERE AND THIS AND THAT

CONDUCTED BY E.L.C.

This department conducti four competitions each month. A prize of $10.00 is awarded in each class as follows: Class 1, sketches or drawings in any medium; Class 2, poetry; Class 3, cartoons; Class 4, miscellaneous items not coming under the above headings. Everyone is eligible to enter material in any of these four divisions. Good Wrinkle Section: a prize of $10.00 is awarded for any suggestion as to how work in the drafting room may be facilitated. No matter how simple the scheme, if you have found it of help in making your work easier, send it in. Competitions close the fifteenth of each month so that contributions for a forthcoming issue must be received by the twelfth of the month preceding the publication date in order to be eligible for that month's competitions. Material received after the closing date is entered in the following month's competition.

The publishers reserve the right to publish any of the material, other than the prize winners, at any time, unless specifically requested not to do so by the contributor.

THE PRIZES this month have been awarded as follows:

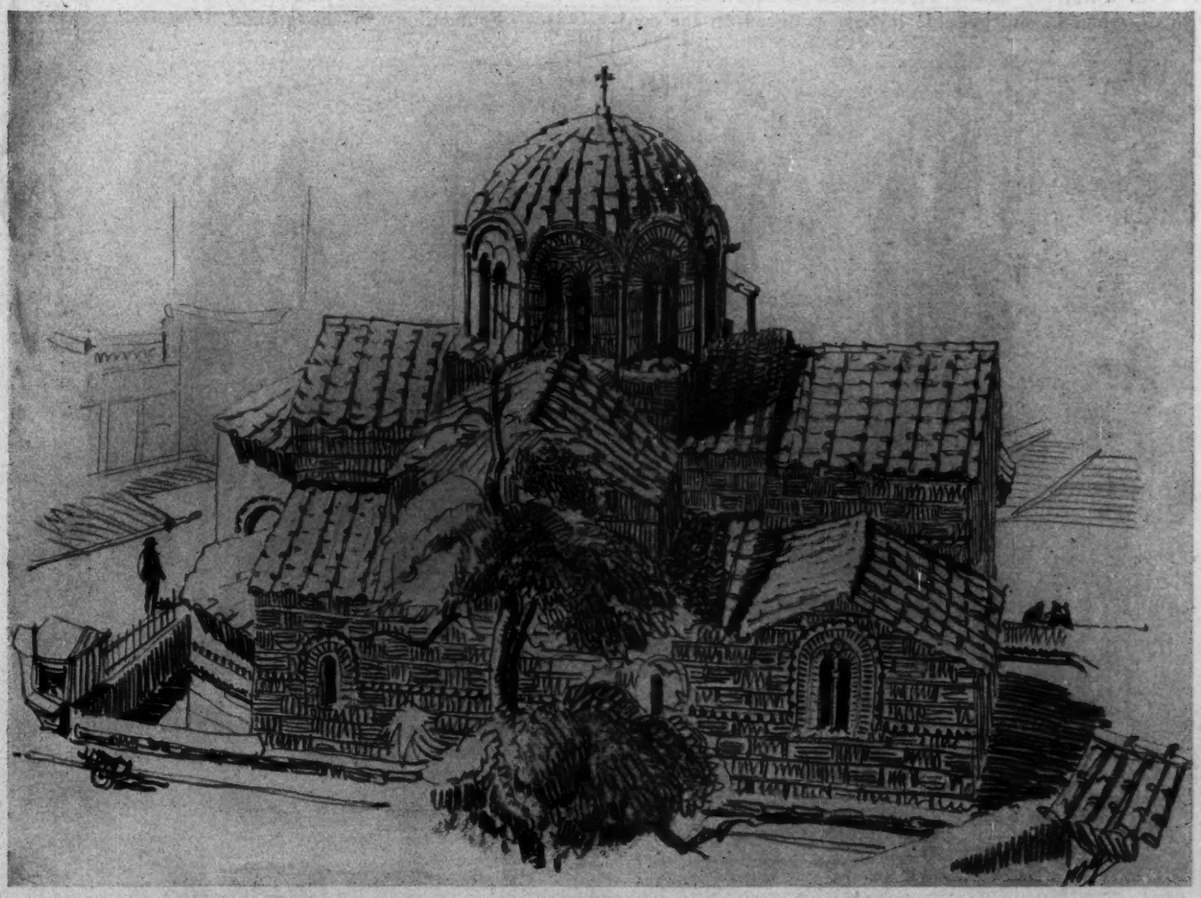
Class I—G. Massena, Wilmington, Delaware.
Class II—Lila French, Minneapolis, Minn.
Class III—A. Caputo, Brooklyn, N. Y.
Class IV—No Award.

We have received a number of advance Christmas cards and are planning to present a group of different designs in the December issue as a belated inspiration to all "last minute artists." Of course we're going to have our annual Christmas Card Competition, too, but this will be announced later.

ALBERT N. TIPPLE of Rome, Georgia, sent us a story that amused us. He calls it "A Timely Hint":

"A friend of mine recently asked the owner of a cleverly designed and well built home who was his architect. 'Oh,' replied he, 'I designed the house, the architect only drew the plans.' "

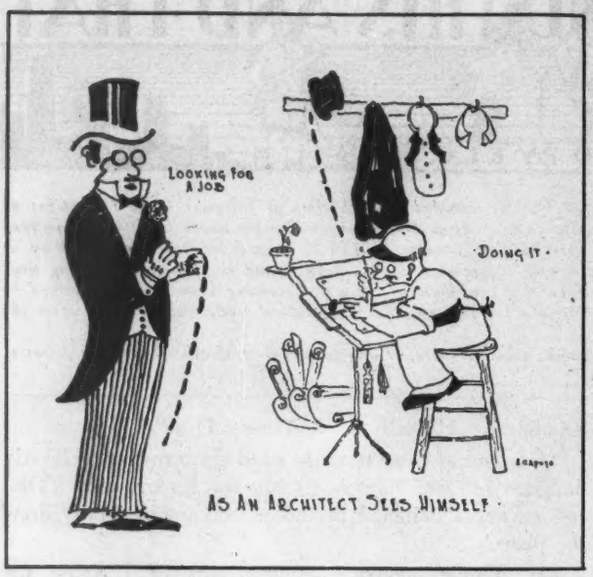
Mr. Tipple suggests the desirability of a course for architects in crystal gazing, mental telepathy, or the fathoming of the subconscious. His idea is that if the architect were proficient in the technique of tapping the reservoirs of knowledge in the worthy client's mind he could more easily do the necessary jackass work for the client, and thereby in no way offend his superiority complexes.



PENCIL SKETCH FROM THE NOTEBOOK OF G. MASSENA OF WILMINGTON, DELAWARE

Church of St. Theodore, Athens, Greece

(PRIZE—*Class One—October Competition*)



CARTOON BY A. CAPUTO, BROOKLYN, N. Y.
(PRIZE—*Class Three—October Competition*)

FROM MR. PHILIP KUTZ, of Los Angeles, comes the following helpful hint:

"You can believe this or not but in my greatest hour of need at 7:30 in the morning when the world is rushing to get to work, my dainty feet refused to squeeze into my shoes, when lo and behold! my eye pounced on the cardboard edge protector which you include free of charge with each PENCIL POINTS and with one application my feet just oozed into the shoes.

"I'll bet you never thought of those things being used as a shoe horn! From now on I'll never be without one."

THE ARCHITECT

By Lila French, Minneapolis, Minn.

(PRIZE—*Class Two—October Competition*)

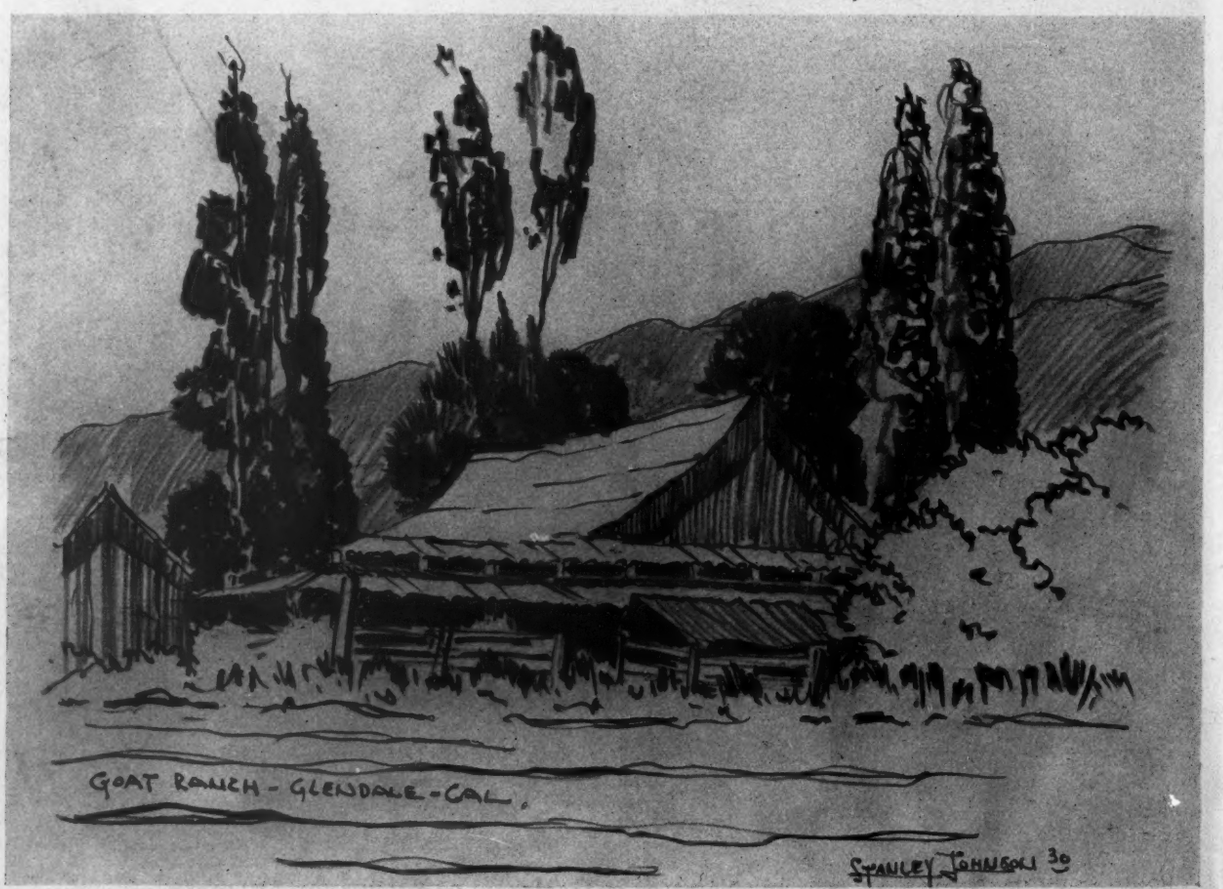
A n Architect is a person who
R arely has anything to do
C atches ideas right out of the blue,—
H e charges plenty for them too;
I n most respects, and these aren't few,
T hose fees belong to his poor crew,
E arned by them,—his work they do—
C ollections made to them are due
T hough spent by him, who does nothing but stew,
Oh Yeah? ! ! Sez Who?

CASTLES

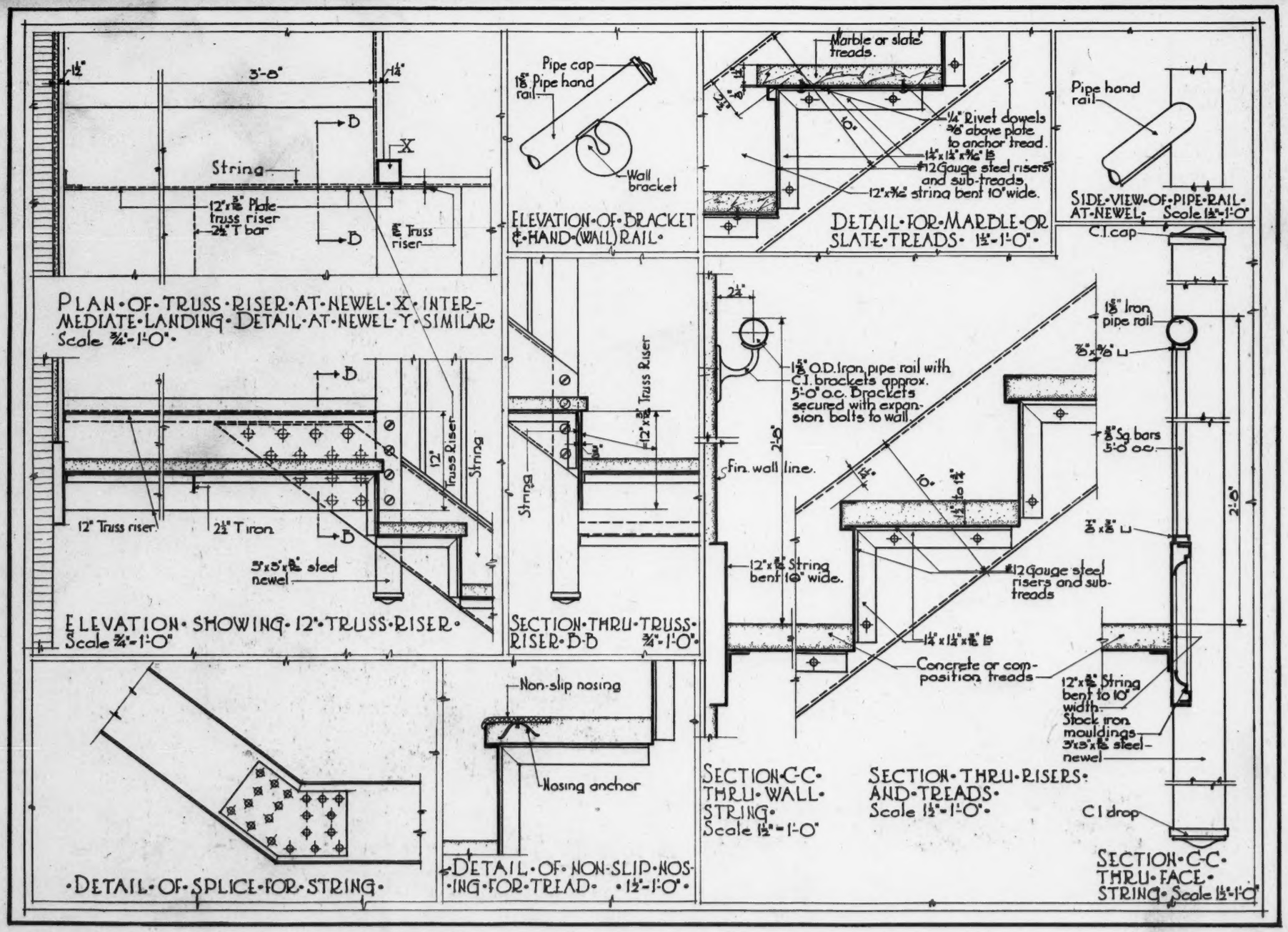
By Evantha Caldwell

It was a dreamer's castle,
A structure, fair and high,
And perfect stood though toil-made ones
All crumbled by and by.

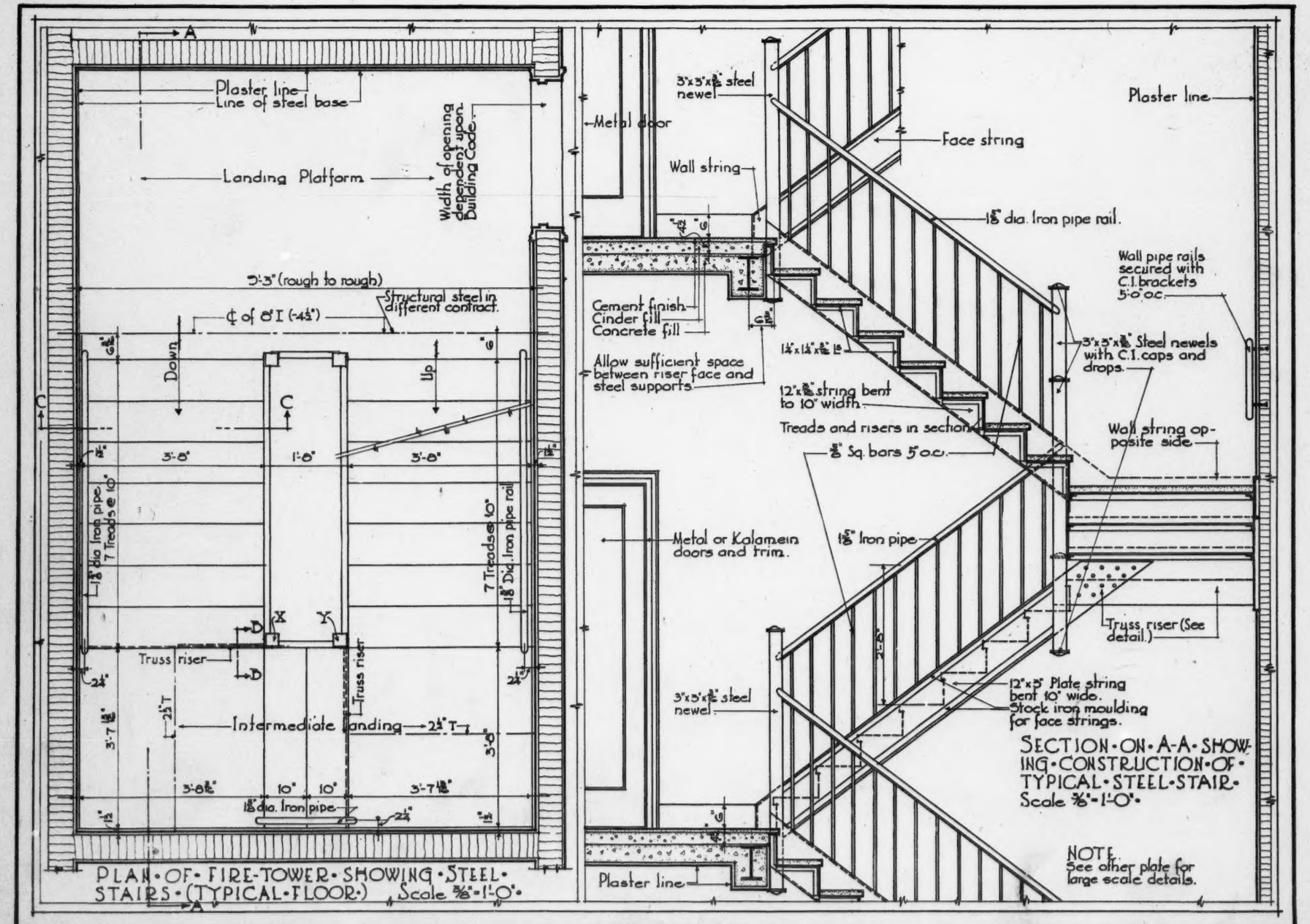
Idea castles, fragile, fair,
More lasting are, men found,
Than those of brick and stone with deep
Foundations in the ground.



LITHOGRAPH PENCIL DRAWING BY STANLEY JOHNSON, LOS ANGELES, CALIFORNIA
Goat Ranch, Glendale, California


PLAN OF TRUSS RISER AT NEWEL X INTERMEDIATE LANDING DETAIL AT NEWEL Y SIMILAR
Scale 3/4"-1'-0"
String
12"x3/8" Plate truss riser
2½" T bar
E Truss riser
X
D
ELEVATION SHOWING 12" TRUSS RISER
Scale 3/4"-1'-0"
12" Truss riser
2½" T iron
5"x5"x3/8" steel newel
12" Truss Riser
String
SECTION THRU TRUSS RISER D-D 3/4"-1'-0"
Truss Riser
String
ELEVATION OF BRACKET ℄ HAND (WALL) RAIL
Pipe cap
1⅝" Pipe hand rail
Wall bracket
DETAIL FOR MARBLE OR SLATE TREADS 1½"-1'-0"
Marble or slate treads.
¼" Rivet dowels ⅜" above plate to anchor tread.
#12 Gauge steel risers and sub-treads.
12"x3/8" string bent 10" wide.
SIDE VIEW OF PIPE RAIL AT NEWEL Scale 1½"-1'-0"
Pipe hand rail
C.I. cap
1⅝" O.D. iron pipe rail with C.I. brackets approx. 5'-0" o.c. Brackets secured with expansion bolts to wall.
Fin. wall line.
1⅝" Iron pipe rail
⅝"x⅜" ⊔
⅝" Sq bars 5'-0" o.c.
⅝"x⅝" ⊔
12"x⅜" String bent 10" wide.
#12 Gauge steel risers and sub-treads
Concrete or composition treads
12"x⅜" String bent to 10" width.
Stock iron mouldings
3"x3"x⅜" steel newel
C I drop
SECTION C-C THRU WALL STRING Scale 1½"-1'-0"
SECTION THRU RISERS AND TREADS Scale 1½"-1'-0"
SECTION C-C THRU FACE STRING Scale 1½"-1'-0"
DETAIL OF SPLICE FOR STRING
Non-slip nosing
Nosing anchor
DETAIL OF NON-SLIP NOSING FOR TREAD 1½"-1'-0"

GOOD PRACTICE IN CONSTRUCTION—STEEL STAIR DETAILS—DRAWN BY PHILIP G. KNOBLOCH



GOOD PRACTICE IN CONSTRUCTION—STEEL STAIR DETAILS—DRAWN BY PHILIP G. KNOBLOCH

THE SPECIFICATION DESK

A Department for the Specification Writer

WHYS AND WHEREFORES OF THE SPECIFICATION

2—DEMOLITION AND EXCAVATING

By Philip G. Knobloch

EDITOR'S NOTE:—*This article is the second in a series in which Mr. Knobloch will explain the whys and wherefores of a specification. He intends to carry the reader through all the various phases, making special drawings to bring out points in his text. We believe that these articles will be welcomed by our readers and shall be glad to receive letters commenting upon them. Acknowledgement is given the New York Building Congress for use of the Standard Specification as compiled by them, which forms a good part of this specification, which is being written for the student, draftsman and the young architect tackling his first job.*

SPECIFICATIONS FOR DEMOLITION must include the removal of structures, trees, etc., that may interfere with the proposed new building. It must be made clear just how much is to be razed. Usually demolition covers the removal of the building from the roof to the grade line, below which foundation walls and footings, because they can be eliminated easily and cheaply with the steam shovel, are removed under the excavating contract.

If the building is in fair condition the wrecker may sell the old materials such as brick, joists, radiators, etc., to second-hand material men as he removes them. At times when the building trade is very busy and new materials are costly the wrecker will offer the owner a certain price for the privilege of wrecking the building and carting away the materials. The wrecker has estimated that the value in the old materials will be sufficient to cover the cost of buying the building, paying the cost of wrecking and removal, and leave a substantial profit.

The wrecker must leave the site clear of all debris and ready for the excavating work to follow.

The problem of tearing down a part of a building to permit the building of an addition requires a more difficult specification. Here, plumbing, electric, and heating lines must be cut and plugged and later reconnected with the new lines. Another necessity is shoring and bracing of the present building. The exposed side of the building must be enclosed so that it will be protected from the weather, enabling any business to continue without interruption. Permits must be obtained from the local building departments, and the Public Service Companies must be notified to plug the water, gas, and electric mains.

While many of these items do not enter into the Demolition Specifications it is here that we must jot down notes for future use so that these items will not be overlooked in their particular specifications. In Demolition Specifications the removal of electrical wiring and conduit is omitted but the removal of wiring, etc., (from the part that is being razed) is covered in the Electrical Specifications. There are some contractors who will take advantage of every doubtful condition in your specification. A thorough specification will make it clear to each subcontractor just what he is to include in his estimate and there will be no overlapping. This means better and closer estimating and a lower total bid.

DEMOLITION

GENERAL CONDITIONS

General Conditions of the contract of the American Institute of Architects, current edition, shall form a part of this Division, together with the Special Items to which the Contractor is referred.

Under the next paragraph heading, "Scope," we list what is included in this contract. Sometimes, if there is a possibility of misunderstanding, we include some of the items that should not necessarily be included. More often we list items not in this contract in a paragraph further on in this specification, as you will note later.

SCOPE

The work in this contract and described in this specification comprises the demolishing of a part of the present church as indicated on the contract drawings Nos. 1 to 12 inclusive. All masonry walls, buttresses to grade, joists, rafters, slate roofing, windows, doors, etc., are to be razed and removed from the site by this contractor.

NOTE:—*Removal of plumbing, heating and electric work is done under another contract. This Contractor shall notify these trades when their respective work is ready for removal. The removal of walls, footings and floors below grade is under Excavating contract.*

EXAMINATION OF SITE

Bidders upon the work in this division, before submitting proposals, shall visit the site and carefully examine the work to be demolished to satisfy themselves as to the nature and scope of the work and the difficulties attending its execution.

The submission of a proposal will be construed as evidence that such an examination has been made. Later claims for labor, equipment, or materials required for difficulties encountered which could have been foreseen had such an examination been made will not be recognized.

PROTECTION

This contractor, as part of this Contract, shall provide and erect all planking, fences, bracing, shoring, sheet piling, lights and warning signs necessary for the protection of the streets, adjacent property, and the public.

Trees, shrubs, or other planting, either on the site, the

streets, or adjacent property, shall be fully protected where necessary throughout the demolition operations, except those whose removal will be necessitated by the excavation. The Contractor is to remove them as directed by the Architect.

At completion of the demolition all protection shall be left in place and maintained until removal is authorized in writing by the Architect.

DEMOLITION OPERATIONS

The work of demolition shall be executed in a careful and orderly manner, with the least possible disturbance to the public and occupants of adjacent buildings.

In general, masonry walls, whether of concrete, stone, brick or other materials, shall be demolished in small sections. Structural steel or similar materials shall be removed individually and lowered carefully. Where necessary to avoid collapse of either walls or framing, shores, struts or braces shall be installed.

Debris shall be sprinkled where necessary to prevent annoyance from dust. In all cases chutes shall be employed to convey from upper stories.

Materials will not be permitted to accumulate on the floors of the building, in the cellar or on any other parts of the premises but must be promptly removed from the site. Granite ashlar may be used again in the north wall of the new building. Granite must be thoroughly cleaned of all mortar and dirt before setting in the wall.

Streets and sidewalks shall be kept reasonably clean during working hours and shall be thoroughly cleaned and swept at the end of each day.

All existing service piping, including sewers, water and gas lines, and all electrical services shall be cut and capped at the property. This will be accomplished by the various contractors in the respective trades, such as the electrical, heating and plumbing contractors, etc. It shall be the duty of this contractor to notify the proper officials or the architect so that this work may be done without delay.

EXCAVATION

In the specification for Excavating we have several important items to consider. The first item is our unit prices. The drawings show the various depth levels required and apparently that is the amount of the excavating to be done. If everything were ideal our worries would be over but there are natural conditions beyond our control that force us to take precautions. One of the most troublesome is that of rock. Rock is not always apparent on the surface and it has a way of cropping out where it is least expected. In localities where rock is prevalent clients allow a sum of money in their building budget to cover possible rock removal. To protect all concerned we request at the time of bidding that a unit price per cubic yard for removal be included in the estimate by the contractor. This means rock greater than one half a cubic yard in size; anything under this size is classed as earth excavation. It also means rock that must be blasted or drilled before it can be removed, and not a soft shaly rock that can be removed with pick and shovel.

The second item in the unit prices is additional earth digging. Suppose the earth, after we have arrived at the footing depth, is soft and insecure and we dare not lay our footings upon it. In that case we must necessarily excavate further until we do get a solid earth for the footings. This added digging must be paid for at so much per cubic yard. To protect ourselves against an unfair price later we request a unit price per cubic yard at the same time the estimates are due. We may not need it, but we have it in case we do. Again, at the time of excavating it may be necessary to make some slight changes in the plans which require extra digging, or we might find good bearing soil considerably above the levels shown on the drawings. If we have extra digging we use the unit price we asked for extra digging. If we omit digging we are entitled to a credit from the Contractor, so we ask for a unit price per cubic yard for this condition.

If the Contractor should excavate to a greater depth than shown, that is his error and the added cost of rectifying this condition is his. He would probably continue on with the foundation walls and take care of the extra depth in that manner. Under the basement floor we would permit him to fill in with coarse cinder or broken stones to the underside of the basement floor. But if the fill required must act as load bearing earth he would have to fill in with 1:2:4 concrete at his expense. Further conditions will be explained as we continue the specifications for excavation.

EXCAVATION

GENERAL CONDITIONS

General Conditions of the Contract of the American Institute of Architects, current edition, shall form a part of this Division, together with the General Items to which the Contractor is referred.

SCOPE

The work included in this contract and described in this specification comprises all of the excavation on the site of the new building as indicated by the contract drawings No. 1 to No. 8 and No. 200 to No. 202 inclusive.

Excavation for the plumbing, heating, and electrical lines is not included in this contract.

GRADES

This Contractor shall obtain a correct datum point from the engineer employed by the General Contractor from which all readings shall be taken for the determination of levels.

LINES

All lines for the new building shall be located by the Engineer employed by the General Contractor.

It is usual for the General Contractor to furnish the engineering data for this contractor. It is his responsibility but the Architect should be certain that the lines are correct. We had an experience of checking an owner's survey on a building in a small city. The survey was made originally by an apparently capable local engineer vouched for by the owner. The General Contractor decided that he would also engage this engineer to stake out the building lines, etc. The lines were staked out, and after being checked they were moved a little to rectify an error. On a recheck they were again moved. The last move removed my confidence and I employed another engineer to assist me in relaying all the lines. Both survey and lines were several inches out and the layout encroached on the neighboring property. Plans had to be changed hurriedly, but the expense was limited to the drafting and extra engineering cost. Had the building been erected with the original survey and lines we would have had plenty of trouble. Unfortunately, in small towns there is no one to assume the responsibility for surveys except local engineers. It is well to recheck each layout when the building is located on building or lot lines where there is danger of encroachment. Where the building sets in the center of a large piece of property there is no cause for worry.

EXCAVATION

This Contractor shall do all the excavating within the

proposed building lines as shown on the drawings for the basement, outside entrances, piers, footings, walls, etc., and all work necessary to complete the building according to the plans and this specification.

The excavation for the building shall be extended 2'-0" beyond the outer face of the foundation walls to allow room for the membrane waterproofing.

This last part of the paragraph mentioning the additional excavating could be omitted if there were not waterproofing included in the specifications.

EXCAVATED MATERIALS

All excavated materials shall be the property of the Contractor and shall be removed and disposed of by him immediately upon being excavated. No excavated material shall be allowed to accumulate on the site or in the surrounding streets. Sufficient material for back-filling may, however, be left on the site or at such points as may be directed by the Architect.

ROCK

Should rock be encountered, this Contractor shall strip same clean and apply to the Architect for levels. He shall remove this rock on a unit price basis (to be submitted with his bid) and shall apply for further levels at completion. The quantity shall be computed by the architect's engineer and his estimate shall be final. All boulders containing one-half a cubic foot of rock or over shall be considered as solid rock.

BLASTING

Where blasting is necessary it shall be done by experienced men and in strict accordance with local ordinances. This contractor shall furnish an ample supply of mats and logs and see that all blastings are properly covered before firing. The utmost care shall be taken in blasting, and every precaution taken to avoid excessive vibration or damage to walls or other portions of adjoining buildings.

SOFT BOTTOM

All old holes shall be solidly filled in and where these occur under outside or bearing walls, piers or constructional points or support, this contractor shall notify the architect before proceeding with the filling. No foundation work shall be started on soft or insecure bottom.

EQUIPMENT, ETC.

This Contractor shall furnish as a part of his contract all necessary shoring, bracing, timbers, trucks and equipment of kinds required for the satisfactory execution and completion of the excavating work and the disposal of excavated material.

BRACING AND SHORING

This Contractor shall do all shoring and bracing necessary to support adjoining streets or structures or retain earth and banks and prevent caving in and displacement of adjacent soil, furnishing all necessary timbers, planking or sheath piling for that purpose. All bracing shall be subject to the approval of the Architect and shall be removed from the site when so directed by him. Bracing shall in no case be placed in such a manner as to thrust against any portion of the building.

PUMPING

All necessary pumping to keep the excavation free from water will be furnished by the General Contractor.

Usually the Architect is aware of the conditions on the property especially when the excavation includes the old basement of the demolished building originally on the site. There are perhaps, in this case, old sewer piping, water mains, etc., running from the old basement through the property where they will be encountered when the excavation starts. In this case the following subhead should be inserted in the specifications.

EXISTING PIPES, ETC.

Existing sewer pipes, water mains, gas lines, electric conduits, telephone conduits, etc., that may be encountered during the excavation shall be braced and supported by this contractor. He shall notify the proper officials so that they will take steps to cut, cap, etc., or proceed as they may see necessary.

WATCHMAN

Watchman to be furnished by the General Contractor.

BACK FILLING AND GRADING

At the completion and final inspection of the subgrade concrete or masonry walls, this contractor shall remove all debris from the premises and shall back-fill against walls with the material retained on the premises for this purpose. If this should be insufficient, the contractor shall supply the additional amount required. All back-filling shall be placed in one-foot layers and each layer shall be solidly tamped and puddled before the following layer is placed, this contractor to form the rough grading as shown on the plans. Final grading, levelling, and seeding of property will be let under another contract.

Back-filling is one of the most important items of the job. If not followed to the letter it will give trouble. Back-filling is really an attempt to replace the earth against the walls as it was before it was excavated. This is done to prevent settlement and water from draining down and along the foundation wall and then leaking into the basement. If the fill is clean earth, wet down and solidly tamped in successive layers, no trouble should be encountered later. Do not permit stones, brick bats, etc., to be used for back-fill. Regardless of whether the walls are waterproofed or not, back-fill correctly.

UNIT PRICES

This contractor shall submit with his estimate the following unit prices.

A—Blasting or drilling and removal of ledge rock per cu. yd.

B—Additional excavation of earth and removal of same per cu. yd.

C—Credit per cu. yd. for earth excavation omitted.

(Part 3 in this series will be published in the December issue and will cover CONCRETE WORK.)

SOME REMARKS ON WATERPROOFING

By C. A. Stewart

Chief Engineer, Anti-Hydro Waterproofing Co.

THE ARTICLE ON *Waterproofing, Dampproofing, and Floor Hardeners* by Mr. David B. Emerson, appearing in your July issue, and the comments on this article by Mr. L. N. Whitcraft of the Portland Cement Association make interesting reading to those of us who for years have been trying to persuade the architect to use integral waterproofing.

It is most refreshing to hear a specification writer for an architect say that he had never seen any concrete not treated by some waterproofing method which was waterproof or anywhere near waterproof. Of course, as Mr. Emerson points out, the Portland Cement Association has for years discouraged the use of integral waterproofings, advancing their theory regarding grading, proportioning, mixing and placing of concrete without admixtures so as to secure waterproof masonry, but the necessary procedure approximates laboratory exactness and not many contractors have either equipment or personnel of the proper type. In the second paragraph of Mr. Whitcraft's article he mentions "many concrete structures" which were made watertight throughout without the use of admixtures. But he does not give specific examples, nor does he describe the water conditions which were overcome.

As a matter of fact the writer had thought that the

NEW YORK STATE ARCHITECTS AND ENGINEERS AT THEIR CLAMBAKE AND FIELD DAY—HELD IN ALBANY ON SEPTEMBER 27TH

Portland Cement Association had discarded this old argument about a "thorough understanding of the basic principles of concrete making and their correct application in the field" being essential to the production of waterproof concrete. Such knowledge cannot be minimized, but some members of Mr. Whitcraft's association seem to think something more is required, since not less than five of them manufacture special waterproof cements.

In Mr. Whitcraft's discussion of the void theory we think he scores heavily. We have never seen an article which more completely explodes the colloid and void filling idea. Of course the way to make concrete waterproof is to reduce the size and number of the voids. The writer is not so sure that uniform distribution of the voids is an essential. Any distribution that eliminates continuous chains of voids from one surface to the other would be equally effective in preventing the passage of water. Make the voids small enough and few enough and you won't have any passage for water. Integral waterproofing of the colloidal type won't do this, but some chemically reacting integral waterproofings will. Moreover, the early strength and the ultimate strength are both decidedly increased by the addition of one of the chemically active integral waterproofings in the specified, commercially-used proportions.

Mr. Emerson feels that integral waterproofing is faulty in one respect—when settlement cracks occur, and leaks follow, integral waterproofing does not remedy them. We think that perhaps a better expression would be "does not prevent them," since the remedy is to cut out and patch the cracks with waterproofed cement plaster—a simple and inexpensive procedure where walls are concerned, and settlement cracks rarely occur in floors. But to the writer, settlement cracks seem rather a fault in design than in waterproofing, whatever type is used. We have heard, and we know there is a popular feeling that membrane waterproofing has sufficient elasticity to take care of settlement cracks or other small cracks of like nature without permitting the passage of water. We should like to see an example. Within the past week we examined a viaduct carrying three tracks of standard gauge, laid on regular sleepers in ballast. The ballast is on a three-inch concrete base protecting a membrane waterproofing laid all over the concrete deck. This deck is carried by cross girders of I-beam section with I-beam stringers in between. The conditions are not severe from a waterproofing standpoint since each track is equipped with a drainage system and only rain and drippage from cars is to be handled. But due to deflection the concrete deck has cracked across the top of each cross girder. And the membrane has likewise opened wide enough to permit the passage of water, but not wide enough to be visible to the eye. With this and other examples in mind we are somewhat skeptical regarding the practical elastic properties of membranes, and until we see proof to the contrary shall continue to believe that cracks in masonry, from whatever cause, invariably destroy the waterproofing at the cracks, regardless of the method used. The answer, we think, as far as building is concerned, is better designed footings.

Mr. Whitcraft writes at some length on construction joints, as being prolific sources of trouble from a waterproofing standpoint. Mr. Whitcraft makes some suggestions regarding the placing of concrete—thin layers—top surface horizontal—rodded and spaded—not allowed to flow over long distances in the forms. All are admirable, but mostly impractical except in very small jobs. He suggests a metal strip at the construction joints. Even in a small job with no steel he would have trouble holding his concrete level enough for a joint of this sort. But in a 16" wall with steel on both sides and forms 18 feet high it just can't be done.

Sooner or later architects will have to recognize the need for more definite specifications regarding the placing of concrete. Particularly as regards ready-mixed concrete which is delivered in from 3½- to 5-yard batches. Now you can take the best, most "sticky" concrete in the world, and if you drop 3½ yards of it through one chute onto one spot in a form, you will have segregation and a stone pocket under the chute. Contractors should be required to place chutes at not more than 10-foot intervals when using ready mixed concrete, but they won't do it unless the specifications call for it. Their main chutes should have gates to make them 2- or 3-way so that all of one batch would not have to go into one spot in the form. Or the chute should be readily movable during pouring—a difficult proposition. The point is that while this placing of concrete has been left to the contractor's fancy, it is really as much up to the architect as the specifying of the mix, the water cement ratio, or the slump. In fact poor placing can easily nullify first-class specifications in other respects.

Mr. Whitcraft speaks of one method of treating construction joints which the writer considers not only the most practical but also the best—namely the placing of a cement grout on the old work just before pouring new concrete. This should be done on all joints, vertical as well as horizontal, and particularly on walls and footings when pouring floor slabs. This should be part of the specifications also unless the manufacturer of the waterproofing is to supervise the job. His engineer will see that grout is used, but unless specified the contractor's superintendent is likely to overlook it.

The question of curing brought up by Mr. Whitcraft deserves the architect's most careful consideration. We think it highly important, particularly in floor slabs, to keep the concrete wet for as long a period as possible. Upper floors in steel frame structures are especially likely to crack if not kept wet down for several days.

We were keenly interested in Mr. Emerson's discussion of spandrel waterproofing and agree heartily with his statement that the spandrel beams are probably the most vulnerable spots in the building as regards waterproofing. Similar weak spots occur on smaller jobs at the ends of beams or girders carried by the wall. We have observed that many bricklayers make it a practice to fill in the space around the ends of such beams with small pieces of brick or any other rubbish that happens to be handy, and a minimum of mortar. Where we have been able to secure thorough parging with waterproofed mortar on all brick contiguous to the beam we have had no seepages at these points. We are prejudiced, of course, but we feel strongly that similar methods applied to spandrel beams will give far more certain results than the method of flashing with cotton fabric described in the article. This subject of spandrel beam waterproofing is one that merits the best attention of both architects and contractors.

In conclusion we wish to commend Mr. Emerson's final paragraph regarding the obtaining of advice from the waterproofing or hardening concern. Such advice costs nothing and may prove very valuable. May we suggest an even better protection for the architect. It is this: accept the advice and use the materials of only reputable concerns who will guarantee the results for not less than five years. The following of this suggestion will eliminate most of the grief from the architect's waterproofing and hardening problems.

A CHECKING LIST

By Archibald E. Hutchins

EDITOR'S NOTE:—*This checking list was sent to us by Mr. Archibald E. Hutchins of San Antonio, Texas. Mr. Hutchins has used this list for a number of years and has found it very satisfactory and helpful, but wishes to submit it to our readers for criticism and suggestions for improvement. We invite your serious consideration and help.*

SUBDIVISION OF DRAWINGS

1. Architectural (General)
2. Structural (Engineering)
3. Plumbing (Roof drainage—sewerage—water-supply)
4. Heating and Ventilation
5. Electrical Wiring
6. Equipment (Furniture—refrigeration—garbage disposal—vaults or safes)

CHECKING LIST

IN GENERAL

Sheet number—date—scale.
Cardinal points of the compass—usually located on plot plan.
Number of rooms—number in circle.

DIMENSIONS OF ALL ARCHITECTURAL FEATURES

Width of all openings.
Reveals.
Center lines.
Axis lines.
Angles.
Closing of dimensions around a building.
Projection of balconies.
Spacing of interior openings.
Clear dimensions of rooms.
Belt courses and projection.
Relation of all projections to the building line.
Datum line for irregular plans.
Section lines.
Radius lines.
Thickness of walls. Interior and exterior.
Base courses.
Panels.
Furring—wood—tile.

DIMENSIONS TO ALL FRAMING

Framing for fireplaces.
Framing over interior openings.
Lintel schedule—length of lintels.
6″ bearing for concrete.
4″ bearing for steel.
Base plates and expansions for steel trusses.

FINISH OF ALL ROOMS

(On large jobs this is sometimes covered in a finish schedule)
Kind of floors.
Trim.
Plinths.
Base.
Panelling.
Chair rails.
Wainscot, painted or otherwise.
Kind of ceilings.
Coves.
Cornices.
Plaster reveals.
Floor borders.
Slopes for floors.
Pitch of porch floors.
Porches.
Areas.
Terraces.
Thresholds.

DOORS

(Usually covered in door schedule with scale elevations giving number required and location)
Size.
Description.
Swing—right-hand or left-hand.
Square head for circular head.
Sliding doors.
Longbutts for doors 180 degrees swing.
Kick plates.
Raised panels.

WINDOWS

(Usually covered on window schedule)
Size.
Description—double hung—casements.
Slip heads—stationary.
Screens—provide access to clean same from both sides.
Shutters—holdbacks.
Leaded glass—reinforcing bars.
Window cleaners' hooks.
Interior shades.
Interior Venetian blinds.
Square head sash for double hung circular headed windows.
Transoms.

STAIRS

Head room.
Newels.
Handrails.
Wall rails (return to wall at ends).
Line of travel on circular stairs.
Materials made of.
Width of treads.
Number of risers and height of same.
Safety treads for cement stairs.
Bull nosings G. I.

EXTERIOR STEPS

Width of treads.
Pitch.
End of buttresses or ramps.
Cheeks of buttresses.
Anchoring of railings.
Stagger joints for stone steps.
G. I. nosings on cement steps.
Mark material made of.

CEILINGS

Centerpieces.
Cornices.
Ceiling lights (provision to be made for cleaning both sides and for wire guards above and below).
Coves.
Low ceilings marked.
Furring of bathroom ceiling to take care of plumbing.
Beams.
Tapestry hooks.
Arched ceilings.
Reflected plans of ceilings and soffits of beams.

ROOFS

Direction of flow of water.

Pitch of gutters.
Points where leaders connect.
Crickets and saddles.
Exterior ladders.
Check vertical wall surface in figuring size of downspout.
Ventilators.
Scuttles and access to all vacant spaces.

CHECKING LIST

Provide adequate receiving and shipping facilities and storage for equipment, trunks, etc.
Head room under all pipes, ducts and furred spaces.
Guards where stairs pass windows.
Guards where windows extend to floor.
All protecting guards 3′ high for protection against falling.
Guards for depressions in grade levels and moving machinery.
Chases, height and size of.
Blackboards.
Bulletin boards.
Tack boards.
Lockers.
Clocks.
Fire alarm.
Plumbing fixtures.
Flashing and counter flashing.
Drains—floor—refrigerator.
Gratings.
Sump pits.
Bulk heads.
Sky lights.
Dome lights.
Light shafts.
Parapets—roof side finish—coping.
Proper daylight for rear halls and passageways.
Fireplaces—hearths—flues.
Shelving in all closets or closet schedule.
Shoe racks.
Cedar closets.
Wheel guards—angle iron—cast iron—stone—concrete.
Flower boxes.
Fire stopping.

ELEVATIONS

Arches—radius lines—spring lines—thrusts—centers—voussoirs—imposts.
Flat Arches—voussoirs and centers for same—camber.
Lines and Levels—center lines—finish floor lines—stair landings — balconies — mezzanines — finish grade — natural grade—basement floor—sump pits—elevator pits—sidewalk levels—curbs—ramps—ridges—eaves — decks — penthouses — parapets — trenches — beams—footings—low point of porch floors. *DATUM LINE.*
Masonry Courses—stone—brick—terra cotta—marble—figure-joints—jointing of sills and heads; bond stones.
Numbers and notes on—models, ornaments, etc.
Bond stones—Lewis bolts on section—L-shaped stones.
No unnecessary repetition of ornaments or other detail (repeat and continue).
Notes of kinds of materials.
Dot in stairways — footings — pits — hidden roofs — chimneys — flues — areas — roof lines — crickets — saddles—raised floors—furred ceilings.
Vents to ground space.
Access to ground space.
Drainage of rainwater:
Leaders—conductor heads—gutters (give size) hanging and concealed interior roof drainage on plan.
Drainage of areas dotted.
Drainage of boiler room dotted.
Drainage of sump pits dotted.
Cast iron or tile boots—splash blocks—kind of leader straps.
Head room in gables or slanting roofs where finish rooms occur for future use.
Check height of all chimneys for draft and all soil pipes for ventilation.
Proximity of soil pipes to windows.
Water outlets—fire plugs—hose bibbs.
Siamese connections.
Meter boxes.
Section lines—projections and setbacks—sunken or raised panels.
Diameters of columns—width of pilasters.
Height of columns.
Height of all railings.
Height of parapets — belt courses — copings — parapet copings—cornices.
Height of bases—area of curbs.
Grilles over basement windows for protection and also other easily accessible openings.
Signs—tablets—inscriptions—street names and numbers—awnings—screens—blinds with wrought iron hold-backs—lanterns—exterior electric outlets.
Dormer and gable cheeks—material made of—support of on construction below.
Projecting hoods—entrances—balconies—and other projection features showing on other elevations. (Side views.)
Flashing and counter-flashing.
Pitch of gutters—high point—low point.
Roof scuttles.
Ladders to roofs from fire escapes.
Penthouses and skylights.
Roof ventilation.
Steel angle lintels.
Stone or other lintels.
Lintels over box frames 9″ bearing.
Check gates for sagging—strong corners or wide bottom plate.

HEATING AND VENTILATION PLANS

Roof vents.
Ground vents.
Ceiling grilles.
Blower fans.
Concealing of risers and offsets.
Ventilators—indirect, inside of wall up chase and to outside of wall.
Location of all radiators—sq. ft.—size of radiators—number of columns—height—type.
Recesses—size of pocket—size of grille.

PLUMBING AND ROOF DRAINAGE

Indicate all classes—give size—note offsets.
Size of soil pipes—vents—rain water drain pipes—clean outs for soil pipes.
Check with all structural parts—beam girders.
Standpipes—Siamese connection at street.
Hose cabinets—height from floor—corbel brick over.
Fire extinguishers.
Place soil pipes independent of partition or block joists.
Water taps.
Hose bibbs.
Lawn sprinkler systems.

(Continued on page 74, Advertising Section)

SERVICE DEPARTMENTS

THE MART. In this department we will print, free of charge, notices from readers (dealers excepted) having for sale, or desiring to purchase books, drawing instruments and other property pertaining directly to the profession or business in which most of us are engaged. Such notices will be inserted in one issue only, but there is no limit to the number of different notices pertaining to different things which any subscriber may insert.

PERSONAL NOTICES. Announcements concerning the opening of new offices for the practice of architecture, changes in architectural firms, changes of address and items of personal interest will be printed under this heading free of charge.

FREE EMPLOYMENT SERVICE. In this department we shall continue to print, free of charge, notices from architects or others requiring designers, draftsmen, specification writers, or superintendents, as well as from those seeking similar positions. Such notices will also be posted on the job bulletin board at our main office, which is accessible to all.

SPECIAL NOTICE TO ARCHITECTS LOCATED OUTSIDE OF THE UNITED STATES: Should you be interested in any building material or equipment manufactured in America, we will gladly procure and send, without charge, any information you may desire concerning it.

Notices submitted for publication in these Service Departments must reach us before the fifth of each month if they are to be inserted in the next issue. Address all communications to 419 Fourth Avenue, New York, N. Y.

THE MART

R. A. Zartman, 246 Fisk Street, Pittsburgh, Pa., has the following for sale: Bound volumes of PENCIL POINTS, 1924 to 1929, inclusive, best canvas binding, new, $3.75 each; Knobloch's *Good Practice in Construction*, Parts I and II, $2.50 each; Clute's *Treatment of Interiors*, $4.00; Fletcher's *History of Architecture*, $7.00; Hamlin's *History of Architecture*, $1.75; Meyer's *Handbook of Ornament*, $3.00; Magonigle's *Rendering in Wash*, $2.00; Pond's *Engineering for Architects*, $1.50; Pond's *Concrete Construction*, $2.25; McGoodwin's *Shades and Shadows*, $2.75; *L'Architecte*, 1925, 83 plates modern architecture, $4.75; Portfolio *Northern Italian Details*, Thomas & Fallon, 143 plates, $4.00; *American Vignola*, I and II, $1.25 each. All are in excellent condition; postage paid.

Bernard Rogge, 532 Chateau, South, Baltimore, Md., has the following copies of the *Architectural Forum* for sale: December, 1928; 1929, complete; January to September, 1930, inclusive.

Monroe R. Sandel, 10 E. Huron Street, Chicago, Ill., will dispose of his entire architectural working library, including rare and out of print books, complete files of PENCIL POINTS and other magazines. Reasonable price.

Joseph M. Kellogg, Dept. of Architecture, University of Kansas, Lawrence, Kansas, would like to have the following copies of PENCIL POINTS: January, October, November, and December, 1928; January and February, 1929.

Gaylord Jones, Santa Maria, Calif., has the following publications for sale: December, 1929, and April, 1930, of the *Architectural Record*, .35 each; September, November, and December, 1926, and March, May, June, July, August, and October, 1927, of the *Pacific Coast Architect*, $1.75 the lot; April and July, 1928, and January, February, August, and October, 1929, and January and February, 1930, of *Architecture*, $2.50 the lot; April 20, May 5, June 5, July 5, August 20, September 5 and 20, November 20, December 5, 1928, and February 20, May 20, June 20, July 5, August 5, 1929, and March, 1930, of *The American Architect*, $3.50 the lot.

John Ries, 155 West Grand, Highland Park, Michigan, has for sale the complete year of 1927, PENCIL POINTS.

Ides Van der Gracht, c/o Delano & Aldrich, 370 Lexington Avenue, New York, N. Y., would like to obtain the following copies of PENCIL POINTS: all of 1920 and 1921, and all except December of 1922; March and April, 1925; September, 1928. He also has the following copies of PENCIL POINTS that he will exchange for the above: June, July, August, and September, 1923; March and December, 1924; January and December, 1926; January, 1927; June and August, 1929; January, 1930. They are in excellent condition, although the advertising sections have been removed.

PERSONALS

SAM BIDERMAN, ARCHITECT, has moved from the Thomas Building, to 1107 Browder Street, Dallas, Texas.

WALTER F. BOGNER, ARCHITECT, has moved from 80 Boylston Street, to 45 Newbury Street, Boston, Mass.

JAMES BUSH-BROWN, LANDSCAPE ARCHITECT, has moved his offices from 112 South 16th Street, to the Architects' Building, 17th Street at Sansom Street, Philadelphia, Pa.

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT, formerly practicing at 1028 Connecticut Avenue, has opened new offices in the Shoreham Building, corner H and 15th Streets, Washington, D. C.

ARTHUR A. STOUGHTON, ARCHITECT, formerly at the University of Manitoba, has opened an office at 200 Donalda Building, 322 Donald Street, Winnipeg, Manitoba.

NORMAN HATTON, ARCHITECT AND ENGINEER, has moved his offices in the O. R. C. Building, to 829 Higley Building, Cedar Rapids, Iowa.

RANKIN & KELLOGG, ARCHITECTS, have moved their offices from 1805 Walnut Street, to the Architects' Building, 17th Street at Sansom Street, Philadelphia, Pa.

(Continued on page 74, Advertising Section)

FREE EMPLOYMENT SERVICE ITEMS WILL BE FOUND ON PAGES 78, 80, and 81, ADVERTISING SECTION

WATCH *Pencil Points* each month for the Eldorado Texture reproductions by Ernest W. Watson. Send for samples of Eldorado, "The Master Drawing Pencil," to Joseph Dixon Crucible Co., Pencil Dept. 167-J, Jersey City, New Jersey.

A CHECKING LIST

By Archibald E. Hutchins

(Continued from page 931, Editorial Section)

Floor drains.
Sump pits.
Fire sprinkler system.
Cesspools—septic tanks.
Catch basins—dry wells.
Loop vents.
Closet fixtures not more than five feet from soil pipe.
List and description of fixtures.

ROOF PLATE AND CORNICE DETAILS

Do rafters run in same direction as ceiling joists in all cases—check difference in conditions of section in relation to framing.
Show relation to window lintel.
Tieing to roof rafters and ceiling joists.
Membering with bank courses or stopping against wall.
Relation to finished wall line or building line.

CHIMNEY AND FIREPLACE DETAILS

Corbel out to support 1st section of flue lining.
Size of throat and length.
Smoke chamber—lining with steel or otherwise.
Splay in back of fireplace.
Passage of other flues.

ELECTRICAL PLANS

Location of ceiling outlets.
Wall brackets—(height from floor).
Base plugs—duplex plugs—floor plugs.
Power outlets.
Switches—2-way or 3-way.
Panel boards—height from floor—lintel over—number.
Circuits—size and number.
Main feed line.
Meter box.
Underground feed.
Location of pole of Public Service Co.
Connections to boiler for return pump on heating system.
Fire alarms.
Clock systems.
Inter-phones.
Telephones—telephone extension.
Connection to servants' quarters.
Annunciator.
Radio—radio extension—ground and aerial.
Push buttons at doors.
Floor buzzers—dining room and other places—buzzer located in kitchen.
Burglar alarm system—small light in corners of rooms, controlled by switch in owner's room.

STAIR DETAILS

Head room.
Risers—dotted and numbered.
Treads—same width to allow for same pitch on stairs—although first tread may be wider.
Circular stair—measure width of tread line of travel 1′ 4″ from inside of railing.
Mark materials.
Mark size of carriages and headers.
Wainscoting—stringers.
Interior dimensions to be rough construction, allow ¾″ for plaster, 2″ for marble or wood paneling, and 1½″ for tile.
Anchoring of railings.
Ramps and easements on railings.
Wall rails (return to wall at end).
Wall rail brackets.
Measure height of raking rail as 2′8″ taken on line with the face of riser.
Height at newel 3′2″.
Height on landings 2′10″ to 3′0″ from floor to top of rail.

PERSONALS

(Continued from page 932, Editorial Section)

HAROLD W. GOETZ, ARCHITECT, has moved his office from the First and Merchants' Bank Building, to the top floor of the Middletown Deposit Building, Middletown, Ohio.

PORTER WRIGHT DORR, LANDSCAPE ARCHITECT, is temporarily located at 77 South Market Street, Boston, Mass.

CHARLES DANA LOOMIS, ARCHITECT, has moved from Ruxton, Maryland, to 12 East Pleasant Street, Baltimore, Maryland.

ARTHUR O. DUNN, ARCHITECT, has moved his offices in the Home Savings and Loan Bldg., to larger quarters at 209 Lincoln Avenue, Youngstown, Ohio.

LEON CARYL BROCKWAY, ARCHITECT, has moved from the Security Building, to Studio Two in the Patio of the Arcade Building, 696 East Colorado Street, Pasadena, Calif.

JAMES S. ARNOT, ARCHITECT, has opened an office at 417 Market Street, San Francisco, Calif.

DICKERSON & RHOADS, ARCHITECTS, have moved from 1001 Huron Road, to 823 Prospect Avenue, Cleveland, Ohio.

C. O. BOYCE, ARCHITECT, has moved from the Atlas Bank Bldg., to 924-26 Chamber of Commerce Bldg., Cincinnati, Ohio.

SKETCH OF RESIDENCE IN RIVERDALE, NEW YORK, BY RUDOLPH G. BOLLING